Railway Age

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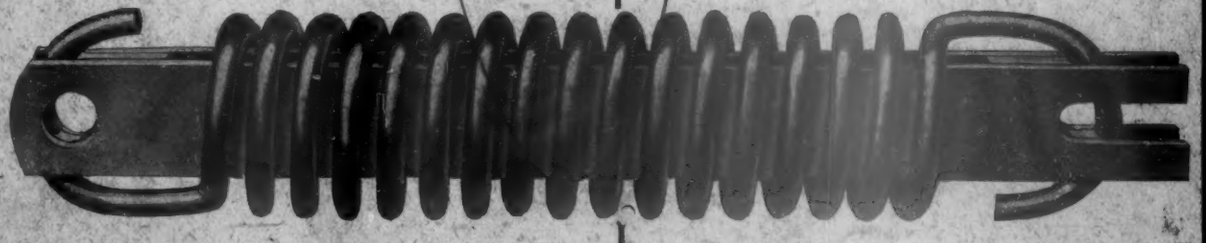

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Alphabetical Index to Advertisements, Page 6. Classified Directory of Advertisers, Page 8.

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EDITORIAL
Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Ship Now!

THERE EXISTS in the United States at the present time a condition which has not existed for five years, except during a few months in 1919: The railroads are able to handle more freight than the shippers are offering to them. This is due to two causes; first, to the great increase in operating efficiency which has been made within the last six months, and, second, to the decline of general business activity which has occurred very recently. As a result of these developments, instead of the freight-carrying capacity of the railways being inadequate to demands, as it has been almost continually for five years, they now have surplus capacity.

Almost all the extraordinary measures which were adopted by the Interstate Commerce Commission and the railways to increase the amount of business that could be moved, such as orders giving priority to coal, regulations severely restricting the reconsigning privilege, etc., have been canceled. Not only can most shippers now get all the transportation service for which they ask, but for the first time since before this country entered the war the traffic departments of the individual railways are actively soliciting business.

There are, however, numerous convincing reasons for believing that this condition will not last long. Larger quantities of products are being held on the farms than ever before in the history of this country. They are being held for higher prices, but in any event they cannot be held long, and it will be only a few months until there will be a large increase in the movement of products from the farms.

Lumber is one of the very largest items of railroad traffic. It is moving now in small volume. All over the country, however, the stocks in the retail yards are very low, while in the Northwest and in the South the lumber manufacturers have upon hand much larger quantities of lumber ready for shipment than ever before. The retailers are waiting for lower prices, but many of them will have to begin to buy or go out of business within a short time.

The retail merchants of the country generally have been staying out of the market so long that their stocks are becoming greatly depleted. They, like the retail lumber dealers, will soon have to begin to buy or go out of business.

Vast appropriations have been made by the various state and municipal governments for the construction of new highways. Most of these are unspent. Highway engineers estimate that one hundred carloads of material have to be transported for every mile of improved roads that is built. The stocks of coal on hand are not large, and it is probable the coal traffic will continue to be heavy.

In view of the foregoing facts, and others that might be cited, it seems probable that within a few months there will be a great revival of railroad traffic. We recently have heard two leading railroad executives predict that within six months freight business will be heavier than ever. The country will then be confronted again with an acute shortage of transportation facilities. The railways have been going ahead rapidly for some months repairing locomotives and cars and rehabilitating their other facilities, and they undoubtedly can handle more business now than ever before, but the total increase in facilities has been small and the amount of increase which can be made in them during the next six months will be small. Therefore, if there shall be within a few months another great revival of traffic the capacity of the railroads will again be found unequal to the demands.

These facts argue powerfully for every individual or business concern that has freight that can be shipped now to begin shipping it. Most farmers will not take kindly to the suggestion that they send their products to market for present prices, which, considering the cost of production on the farms during the last year, undoubtedly are too low. It is desirable, however, that the farmers should at least recognize the fact that if they do not ship now they will later have the same difficulty they did a few months ago in getting freight cars. The retail lumber dealer has a right to delay buying if he wishes, but he should at least concede that if he does not buy lumber now, when the railways can furnish cars he cannot fairly blame the railroads later if they are unable to furnish cars to transport lumber which he has postponed buying.

Concerns engaged in construction activities, such as the construction of highways and the erection of buildings, have complained bitterly during the last year because the orders of the Interstate Commerce Commission giving priority to the use of open top cars for the transportation of coal interfered seriously with the construction business. There are several kinds of building materials which can be produced and transported almost as well at this time of year as when the weather is mild. We are told, for example, that cement can be piled up and protected from severe weather by a loose covering of boards. Construction activities require such a large amount of transportation that those engaged in them should spare no effort to ship within the next few months the largest volume of materials they can.

The shortages of coal in New England and the Northwest this year have caused demoralization in transportation. The coal simply had to be delivered to these territories, and its transportation interfered seriously with the movement of other commodities. These coal shortages existed chiefly because the consumers and coal dealers of New England and the Northwest did not begin early enough in 1920 to lay in the stocks of coal which they knew they would require. The nation ought not to tolerate a recurrence of the conditions, transportation and otherwise, which were created this year by the failure of New England and the Northwest to buy coal when they could get it. The consumers and dealers in those sections ought to begin making arrangements at once for getting their next year's supply of coal so that the railroads can begin to supply them early in the year 1921, while there is a surplus of railroad capacity. It may seem a harsh thing to say, but if New England and the Northwest do not take timely measures to provide themselves with an adequate coal supply next year they ought to be allowed to suffer the consequences.

The *Railway Age* tenders the slogan "Ship Now" as one which ought immediately to be adopted by the business interests and the people of the country. The only way it

can be made possible for the railways to handle anywhere near satisfactorily, with their existing facilities, the present normal commerce of the country, is for freight to be shipped in something approaching uniform volume throughout the entire year. The time is past and will not return again until there has been a great increase in railroad capacity, when the railroads can satisfactorily handle all the freight offered to them if, as was the case in past years, it is offered to them in only small volume in about eight months of the year and in very large volume in about four months of the year.

Shippers must, under present conditions, ship not just when they want to, but when they can get cars. If shippers who can now get cars do not ship now, they will have no just ground for complaint if, when a few months hence they want to ship, they are not able to get cars.

Extent of the Decline in Freight Traffic

The decline in freight traffic has become a decided reality and not merely something to be feared. The number of carloads of freight handled in the week ending November 27 was only 797,673. This compares with the maximum of 1,010,951, which was reached in the week ending October 23. In other words, the railways handled in the week ending October 23 26 per cent more freight than in the week ending November 27, which shows how much more business they could be handling under present favorable weather conditions than they actually are. In one sense, however, the figures look worse than they are. Freight traffic usually has reached its maximum in October and declined more or less rapidly after that month. The number of carloads handled in the corresponding week of 1919 was 739,197, and in the corresponding week of 1918, 735,628. The total traffic handled therefore continues to be larger than in the corresponding period of any previous year. However, the continued large movement of coal is mainly responsible for this. The fact that about 25 per cent of the capacity of the railways is not now being used is the best possible reason why shippers who can do so should "Ship Now."

Consider the Human Element

One of the aims of the ambitious maintenance of way officer is a capable and efficient force of track men, intelligently and wisely directed. This requirement naturally entails considerable study, the first step in which is to consider the character of present day track labor and what it may be composed of in the future. While many of the men employed are probably wanting in industry and general efficiency, two influences have tended to make them somewhat different from what they were in many cases five years ago—raw, green foreigners. In the absence of immigration until recently, these foreigners have had five years in which to absorb something of our language and methods of conducting work, if not as much of our ideals as we would wish. During the same time an unprecedented dearth of labor has given a great impetus to labor saving equipment. Consequently, there has been a trend toward the elimination of at least a part of the heavier manual operations and many laborers are gradually approaching the stage where they can be justly called workmen or even machine operators. As a consequence of these influences these men have enlarged their capacities for higher grade work and have taken a number of steps up in their mental attitude towards life. But only a beginning has been made. To gain the full advantages of this tendency it must be recognized that trackmen are as thoroughly human as any others in the railroad family. This vital human element, as it has been called, should be carefully taken into consideration by every ambitious officer for it is an important and powerful factor. When studied and well handled it leads to an efficiency which increases almost in proportion to the attention given it.

The Times Have Changed

For the last five years the man who supervised the work of others was confronted by one incessant source of worry—how to get enough help. Now, after a brief transition, he finds himself occupied in turning away a continual stream of applicants. To have a job now is to be considered fortunate. To hold it is worth some extra effort. Unfortunately, government control saddled all departments of the railways with a seniority system which serves to prevent the roads from deriving the full benefit from the present labor surplus. Nevertheless, the principle of seniority is not so thoroughly established in some departments, as for instance that of maintenance of way, but that the condition of the labor market will have a wholesome effect on the attitude of the men. This tendency, if properly fostered by the supervisory forces through the recognition of industry and loyalty whenever the opportunity affords, will do much towards restoring the old time railroad efficiency.

When Assigned Engines Are Economical

The pooling of locomotives is now an almost universal practice on American railroads. The sole advantage of the system lies in the fact that it increases the monthly mileage per locomotive and enables the traffic to be moved with the minimum number of engines. In periods of heavy traffic, this is doubtless more important than the lower maintenance cost and decreased fuel consumption that result from assigning the power, but is this also advisable when plenty of engines are available to handle the traffic? Certainly if a fair number of repaired engines are in storage available to meet emergencies, it is better to assign engines than to store some that have made part of their allotted mileage. The fixed charges are the same whether the engine is in service or out and depreciation due to the weather is often serious with stored engines. While the assigning of a locomotive to each crew may not be feasible under present conditions, good results are obtained where two or three crews operate the same engine. The men learn the peculiarities of the individual locomotive and they give more attention to correcting defects because they benefit by the extra care which they give to the power. At the present time when some roads are laying off crews, there is good opportunity for assigned engines. The general manager who thinks that enginemen no longer take as much interest in maintaining power in good condition as they did formerly will probably be obliged to change his opinion if he takes his locomotives out of the "chain gang."

Get Ahead of the Bad Order Cars

At the return of the railroads to private operation they were faced with a serious problem of handling an unprecedented volume of traffic with equipment which was both inadequate in quantity and poorly maintained. Plans were immediately formulated to clear up the traffic congestion. Transportation efficiency has been greatly increased, and a great deal has been accomplished in the carrying out of these plans. Congestion has been eliminated chiefly by securing better car mileage and heavier car loading. No such satisfactory results

have been achieved, however, in reducing the number of bad order cars. At the time the railroads were returned to private operation seven per cent of the freight cars of the country were in bad order and the plans formulated by the Association of Railway Executives contemplated the reduction of this excessive proportion to four per cent. The next two months showed a slight decrease but since May the percentage of bad orders has averaged over seven continually and the latest available data shows that on November 15, the number had increased to 7.7 per cent, or a total of 174,189 cars. The November figures undoubtedly reflect the effect of the drastic reductions in shop forces which were made in many cases, but while this may explain, it does not justify the continuance of the present excessive proportion of bad order cars in the face of the increased traffic demands which may have to be met at any time. Over 135,000 cars have been scrapped since March 1, while only a comparatively small number have been built, and the necessity of increasing the proportion of those available, which can be used is even greater than when the campaign of improvement was started.

Keep Up the Heavy Car Loading Habit

The loading of cars to capacity may become in large measure a matter of habit if the men on the loading platforms are properly trained and supervised. Unfortunately, the reverse is also true. Herein lies one of the dangers of a car surplus. In times of heavy traffic and consequent inadequate supply of cars, a shipper has an incentive to load cars to capacity for it is only in this way that he in common with other shippers can secure a sufficient number of cars for his needs. When business declines to the point that the car supply is equal to or greater than the requirements, as at the present time, this incentive no longer prevails and as it is usually more convenient to load cars light than heavy, the habit of light loading is readily acquired. The result is that when traffic again creates a demand for cars in excess of the supply, as many railway men believe will be the case next spring, it is some time before shippers again bring their loadings up to the maximum. It is economical for the railways to promote heavy loadings at all times. They can, therefore, well afford to keep this matter before the shippers and solicit their assistance in order that the lessons learned in recent months may not be forgotten.

Equipment Orders in November

On another page of this issue we show our usual monthly tabulations of orders for cars and locomotives. The figures cover the orders reported in the issues of the *Railway Age* in November, and are also given cumulatively for the first eleven months of the year. They show that during November orders were placed by the Class I roads for only 39 locomotives and 2,000 freight cars and that no passenger car orders were reported. The total orders reported for the Class I roads for the eleven months included 1523 locomotives and 823 passenger cars. The freight cars ordered by Class I roads in the same period totaled 47,142; including orders placed by the smaller roads and by private car lines and industrial companies, the total of freight car orders for the eleven months was 65,070. It is evident that 1920 is going to be rated in the future as one of the poor years in the matter of new acquisitions of motive power and rolling stock for the railways. It has been many months now since the railroads have done any real buying of equipment. Their requirements along these lines—and there is no question about their being considerable—represent a big problem which the carriers still have before them.

Why the Railroads Should "Buy Now"

WE PUBLISH elsewhere in this issue an editorial presenting some reasons why shippers should ship as large amounts of commodities as they can now, while the demand for transportation is temporarily less than the amount the railways can supply. There are probably few railway officers who will not concur in the views expressed in our "Ship Now" editorial.

The fact should not, however, be overlooked that most of the arguments which can be advanced for shippers shipping now can be used with equal force in favor of railways buying normal amounts of materials and supplies now. The railways as purchasers and users of materials and supplies are shippers themselves. They are, in fact, among the very largest shippers in the country. When, therefore, they refrain from buying the quantities of materials and supplies they normally need for carrying on their business they help to produce the same transportation and general business conditions which farmers, retail lumber dealers, construction concerns and retail merchants do when they refrain from selling or buying and shipping the normal amounts of commodities.

It is not stating the case too strongly to say that in the past the railways have been among the worst disturbers of general business conditions. It is a by-word among railway equipment and supply companies that with respect to railway purchases it is always a case of either "feast or famine." It is almost literally true that the railroads all buy at once and all refrain from buying at once. Most of them buy in large amounts when their earnings are large and refrain from buying when they are small. But when their earnings are large this is always due to the fact that general business activity is great, and when general business is great the prices of equipment and materials usually are relatively high. On the other hand, when the traffic of the railways is relatively small, this is because general business is not active, and when general business is not active prices usually are relatively low. The result in the past has been that most railways have made the greater part of their purchases when prices have been high and have not taken advantage of the situation when prices have been low.

This purchasing policy of the railways has been one of the principal causes of the wide fluctuations of railroad traffic. Every order a railroad places for a ton of materials results in several tons of fuel and raw materials being transported to be used in the manufacture of the finished product which the railroad has ordered. Therefore, if the railways buy large amounts of materials when general business is active they thereby greatly increase the amount of freight they have to haul; while, if they largely reduce their purchases when general business slumps they greatly reduce the amount of freight offered to them for transportation.

It is a well-known fact that within recent weeks there has been a very sharp reduction in the amount of materials ordered by the railroads and that their purchases of most kinds are at the present time at a low ebb. One of the principal reasons for this is the great uncertainty which has been felt regarding the amount of net return the companies will earn under the new freight and passenger rates. Another important reason is that the railways have been hoping and waiting for lower prices.

These reasons for reducing purchases undoubtedly are valid, but their validity is not sufficient to justify from either the railway or the public standpoint a long continuance of the present policy. There is no good reason for believing that prices in general or the prices of the particular commodities that railways buy in large quantities are going much lower in the immediate future than they are now, or that there is going to be any permanent large reduction in them for a long time to come. The manufac-

turers of railway equipment and supplies are in very much the same situation as the railways themselves. Their labor and other costs are still on a very high basis, and it will take a long period to make any permanent large reductions in them. The railways may bring about further reductions in prices by staying out of the market, but the longer they stay out the more they will have to buy when they come back into the market, and the more they buy then the more they will stimulate the tendency of prices to advance again. Furthermore, by staying out of the market, the railways are substantially reducing the volume of freight shipped and the amount of their own freight earnings; and the longer they refrain from buying the more they will contribute towards increasing transportation congestion and shortage of cars when they go back into the market.

While, therefore, it seems sound doctrine that shippers who can do so should "ship now," when there is a surplus of transportation capacity, it seems for almost exactly the same reasons, to be sound doctrine that the railroads should "buy now" to as large an extent as they are reasonably able. There is another argument of great force in favor of the railroads buying now to as large an extent as they reasonably can. Every day that they postpone buying they are delaying the rehabilitation of their facilities which will be needed to enable them to handle the large traffic which seems certain to be offered to them within a few months.

From the standpoint of the welfare both of the railroads and the public a policy on the part of the railroads of making more uniform purchases from month to month and year to year is greatly needed. In the long run this would save the railroads themselves many millions of dollars and would exert a very beneficial influence as a stabilizer of general business. Since no ideal time for adopting such a policy will ever come, the present would seem to be as good a time as any for beginning to adopt it.

The Lehigh Valley Decision

IT IS NOTEWORTHY that despite the importance of the United States Supreme Court's adverse decision in the matter of the Lehigh Valley coal properties there was only a slight flurry in that company's stocks on the New York Stock Exchange. The decision in a measure was foreshadowed by the previous decision some time ago along somewhat similar lines in the Delaware, Lackawanna & Western case and in that relating to the Philadelphia & Reading. It is likely also that observers do not expect much change in traffic relationships through whatever plan the Lehigh Valley Railroad may adopt to divest itself of its coal properties to conform with the decision. The Lehigh Valley is, next to the Philadelphia & Reading, the largest of the anthracite coal carriers. In the seven months, April to October, 1920, there originated on its lines a total of 7,272,781 tons of coal, or about 18.3 per cent of the total of 39,720,654 tons originating on the lines of all the anthracite coal carriers. The Reading carried 8,026,710 tons. It is well known that the anthracite deposits are found in a very small area in north-eastern Pennsylvania.

The story of the anthracite coal industry is primarily a history of the manner in which the railroads serving this small area sought to control absolutely the traffic from these fields and of the efforts they made to secure control of the coal properties in their respective territories to the end that the coal produced along thir lines would be transported over their own rails. This they brought about in a number of ways, one of which was by securing stock control of the coal companies, as was done for example in the case of Coxe Brothers & Co., named as one of the defendants in the present case. The court's decision, in referring to this aspect, said that 95 per cent of the Lehigh Valley's coal tonnage was controlled by it in 1908, through its "complete dominance of the parent coal company which produced the tonnage." The anthracite carriers also secured control in one way or another of competing independent roads and in a number of cases by buying up the independent coal operators which backed such lines, they prevented the construction of new competing coal carriers from the coal fields to tidewater.

Thus we have outlined, we believe, the reason for the lack of apprehension concerning the results of the decision. The reasons for securing control of the coal properties are now in a measure a thing of the past; it is most unlikely, for example, that any new railways might be projected from the coal fields to tidewater under the present conditions of railroading. It will also be borne in mind that it is difficult to sever traffic relationships once made; it is unlikely that coal from the mining companies concerned in this case will go in the future over any other line than the Lehigh Valley, itself. Attention might also be called to the statement by President E. E. Loomis of the Lehigh Valley quoted elsewhere in this issue that the road has already made considerable changes as to its relations with its coal properties since 1914, on the evidence for which year, he contends, the court's decision is based.

Stealing From Freight Cars

ALL WHO KNOW anything about the subject agree that one of the principal causes of the very large increase in the item of loss and damage of freight which has occurred within recent years is a large increase in the amount of stealing from freight cars. They also seem to agree that most of this stealing is done by railway employees, or organized gangs working in connivance with employees. Nobody charges that many railway employees are thieves, but the facts show that there are enough thieves among them to result in a vast amount of pilferage by them. The railway companies maintain police departments whose duty is to protect their property and that of their patrons. The amount of stealing being done does not speak well for the efficiency of railway police forces, and the increase in it which occurred under government control does not indicate that under it the efficiency of the railway police was enhanced. Since so large a part of loss and damage of freight is due to stealing one of the best means the railways could adopt for reducing it would be to improve the efficiency of their police departments. There are many competent and honest men in their police departments, but on the whole the personnel is not of the highest character. There is reason to believe that a thorough investigation of the causes of pilfering would show that collusion between the police and thieves was not always lacking.

It is remarkable, and perhaps significant, that in spite of the large amount of stealing done from cars there have been very few cases of car thieves being sent to prison. One of the main reasons is that when arrests are made it is unusual for convictions to be secured. About a year ago a notorious character in a suburb of Chicago was arrested as the head of a gang of car thieves, and a large amount of goods which had been stolen from cars was found in his possession. He was arrested, but has not yet been even started towards the penitentiary. Between the laziness and incompetency of railway police, municipal authorities and federal authorities, stealing from freight cars is one of the safest and most profitable of outdoor sports. A nation-wide drive by the railways against thievery from cars in which "pitiless publicity" and more prosecutions were used would result in reductions of loss and damage of many millions of dollars a year.

Handling L. C. L. Freight in Interchange by Motor Trucks

IN OUR ISSUE of last week we referred to the possibilities of the use of motor trucks by the railways in the conduct of their routine railway operations, and pointed out several avenues for their employment. One of the applications to which we referred was in the transfer of less than carload freight in interchange between connecting roads.

Local package freight comprises over 100,000,000 tons annually, or over 4 per cent of the aggregate tonnage of the railways, although from the nature of the service the revenue received from this traffic and the cost of handling it bear a much larger ratio to the total earnings and expenses. Approximately one-half of this freight originates at a point on one road and moves to a point on another road. Such freight must be transferred by the originating road to the receiving line at a junction point at its expense, such freight frequently being interchanged several times before the shipment reaches its destination.

This interchange is now made either by movement from one freight house to another by trap cars or by trucking directly across the city.

As indicative of the magnitude of this interchange movement an exhaustive investigation of the traffic handled in Chicago a few years ago showed that over 6,500,000 tons of less than carload freight passed through the forwarding freight house in that city annually, of which about 60 per cent, or 4,000,000 tons, was received in interchange from other roads. Approximately one-half of this interchange freight, or 2,000,000 tons, was trucked across the streets from one freight house to another, while an equivalent amount, or approximately 6,500 tons daily, was moved by trap cars.

Owing to the relatively light loading of cars which package freight necessarily requires, the drain on the terminal capacity of the roads participating in this switching movement is self-evident.

One of the primary problems in almost all terminals now is that of adequate capacity. It has long been realized that the greatest deficiency in railway facilities is at the terminals and the experiences of the last three years have demonstrated repeatedly that the capacity of the roads is fixed by that of their terminals. Therefore, any means by which the present burden may be lightened makes possible a corresponding increase in the volume of other freight which can be passed through the terminals and in like manner increases the capacity of the railways as a whole. One means by which the terminal capacity may be increased is by relieving the terminals of the switching incidental to the transfer of this less than carload freight in interchange by substituting the use of motor trucks for that of cars. That this will afford no small saving is indicated by the experience at Cincinnati, where the substitution of motor trucks for trap cars in the transfer of interchange freight aggregating about 660 tons daily has released nearly 200 cars from continuous trap car service and eliminated approximately 300,000 switching cuts annually.

While the removal of this traffic from the already overtaxed rails of the terminals is the most important consideration, investigation probably will show that much if not all of this freight can also be handled by motor trucks at equal or less cost than by present methods, considering out-of-pocket or direct transportation costs only. Another important consideration is the reduction in the amount of time which will be required for such movements, the use of motor cars in Cincinnati effecting a reduction of 52 hours in the average time required for interchange. In view of these showings, the motor truck warrants careful consideration from operating officers as a facility for their use in increasing the capacity of their terminals, in reducing the cost of their less than carload interchange service and in expediting it and thereby promoting the interests of the shipper as well as their own.

New Books

The Locomotive Up to Date. By Charles McShane. Revised edition, 893 pages, illustrated, 6 in. by 9 in., bound in cloth. Published by Griffin & Winters, Chicago.

The remarkable development of the locomotive and locomotive appliances which has taken place since this well known book first appeared in 1899, made a revision imperative if it were to continue to be of current interest. This work has been performed by Charles L. McShane. The book is non-technical in character and in many respects perhaps too superficial in its treatment to be of value to any one but a novice in locomotive design, maintenance or operation. By far the greater part of the space devoted to descriptive material is taken up with locomotive specialties rather than with the construction of the locomotive itself and the revision has consisted largely in bringing these sections up to date. So many of the more recently developed locomotive appliances, some of them well established, are so lightly touched, if touched at all, that the volume can hardly be said to justify its title, even in the field to which most attention has been given.

In the revisions of those sections dealing with breakdowns and shop work no account has been taken of the requirements or effects of the Interstate Commerce Commission locomotive inspection rules and the revision has failed to disguise the fact that these sections are most directly applicable to the motive power of 20 years ago. Over one-third of the volume is devoted to valves and valve motions and the sections dealing with these subjects are the most thorough and complete of any in the book. The fundamentals of valve motion and the determination of valve proportions and vents have been thoroughly handled in so simple a manner that they may readily be comprehended by the novice while still offering much of interest to those of greater experience. All of the valve motions now used in locomotive service are described and instructions for valve setting are given in each case.

Explanation of Train Rules and Train Orders by O. W. Brandt, Train Rule Examiner, Union Pacific, Kansas City, Mo. 169 pages, 4¼ in. x 6¾ in. Bound in Leather. Published by the Author.

This book was prepared with the idea of making clear every rule pertaining to the duties of employees in train, engine or telegraph service and to be of help to those who want to be right or who are preparing for promotion. No book published along general lines can be taken as authority on any one railroad as they apply to all in a general way. This book covers the operating rules of the Union Pacific, St. Joseph & Grand Island, Oregon Short Line and Los Angeles & Salt Lake and is applicable to all using these tracks. It is based on instructions given by examiners when instructing or examining firemen, brakemen, engineers, conductors, operators and train despatchers. The book covers rules relative to train movements and the handling of train orders by telegraph or telephone including 35 pages of explanation of change of time table (Rule 4) with 12 examples and 56 train order examples with explanations.

Fifty questions on change of time table and 127 questions on train order examples are also contained in the pages of the book.

Letters to the Editor

To Perfect the Train-Staff System.

CHICAGO.

TO THE EDITOR:

The letter of your correspondent, R. Diefendorf (July 9, page 51), who proposes the more general use of the train staff in this country, suggests some interesting speculations. I understand that the Union and the General signal companies have both ceased pushing the staff apparatus; and it may be that they, and some railway officers, think that the staff is out of date; but it is well not to be too sure.

The length of railroad in the United States operated under the electric train staff system is not inconsiderable; it is, according to the government statistical report, no less than 461 miles. The train staff is recognized as the safest method of operating the block system, and under some conditions it is the cheapest (except the simple telegraph block with no mechanical check); so that the fact that it is in rather limited use cannot be taken as evidence that the principle lacks merit.

The collisions or hazards of collisions which have been reported in connection with staff working have all been due to flagrant disregard of rules; and one may almost certainly predict that the only remedial measures likely to be taken, when such hazards occur, to prevent their recurrence, will be to reissue or stiffen the rules. Stiffening of the rules is proper, of course. And, as in other things in which we depend for safety on the unaided and uncensored mind and conscience of the engineman, surprise checking is also useful and desirable. But there is one element of safety that used to be found in the old English staff system (not electrically controlled) which in this country, usually, is omitted; namely, the loop tracks at the stations. With a loop of adequate length, the rules can be made more simple, and the temptation to break them is largely done away with. With no loop; with Staff A-B to be delivered and Staff B-C to be picked up, at the same station, or booth or staff crane; and in the absence of supervision by a critical and persistent inspector the system can never be at its best, and its acknowledged merits are likely to go unappreciated.

With complete installation of distant signals and track circuits such as are in use on the Great Northern (79 miles of road) the layout provides the fundamental elements of safety. The provision of pouches (which must be used), made of such sizes or shapes that they cannot be used for the wrong staff, and the slot in the pouch for rendering the staff always visible, are useful additional precautions.

With loop tracks of adequate length, all four leads to and from the single-track fitted for full speeds—or, say, 40 miles an hour—and suitable staff cranes, eastbound and westbound, separated one from the other and not on the same side of the road, the chance of error would be reduced to the vanishing point. If, in addition, the operator is required always to put the staff in the crane, never handing it to a man, and if the arrangements are such that this requirement is not too irksome, the system would provide theoretically perfect safety from the mechanical standpoint. With the further addition of low-voltage electric switch machines, enabling the station signalman to set the outlying switches without leaving his chair, the system would provide all needed celerity as well as safety.

Where staff operation is carried on under hindrances of such character that officers and trainmen consider it cumbersome, the addition of the features here suggested should be worth considering. The substitution of automatic block signals, is, of course, the natural American way of meeting any or all difficulties that may be experienced with the staff system; but, as your correspondent well says, the question of the flagman is important. It is to be remembered that not even with the automatic system, in its best estate, do we dare to do away with flagging; whereas with the staff we do put that ancient custom in the background.

The deciding difference between the two systems is in the provision for moving trains in the emergency of a failure of apparatus. With the automatic system, a train may move in spite of an inoperative signal, simply by sending a flag ahead. With controlled manual signals the despatcher or some proper authority permits a signalman to release his signal by the use of a special key. In either case the suspension of the normal method of operation is a simple and easy process—so easy that a signalman or an engineman may too readily forget the gravity of his duty and responsibilities in the premises. On the other hand, with the staff system, the special unlocking key is the staff itself, and that is in the hands of the engineman. Until he reaches a station there is no way of getting at him to take away from him his right to the road, and therefore the simplest way to meet the emergency of a signal out of order is *not to meet it;* but rather to go and get that special key (the staff). With the regulations thus simplified the rule providing for the maintenance of flagging can be abrogated.

CONSERVATIVE-PROGRESSIVE.

Newly Painted Instead of New Stations

STAMFORD, CONN.

TO THE EDITOR:

A good deal of agitation is heard from time to time from cities and towns which demand new stations. Often there is some foundation for complaint. The station, perhaps, is 20 years old and has, through neglect, become dingy. Direction boards, if they exist, have become illegible at any distance. Passengers ask directions from laborers or anyone and are, often as not, directed wrong. Altogether there is much confusion and the station gets a black eye in the minds of all who use it. The newspapers take the matter up, and after a time the road is forced to make a large appropriation for a new station.

In many cases, however, a new station is entirely unnecessary, aside from the fact that the money, even in urgent cases, could be spent, at present anyway, far better in improving transportation. The major part of the time spent on a railroad by the public is on trains and not in stations, but often there is evidence of more money being spent proportionally on stations than on rolling stock and appurtenances.

A good clean up and a few alterations and additions would frequently stop all complaints. White paint on the interior of stations and whitewash, frequently renewed on underground passages, good illumination, substitution of underground passages for overhead, which involve twice as many steps as the former and add to the difficulty in getting from one platform to another, clear direction boards both inside and outside station, are important items. The separation, as far as possible, of mail, baggage and express from the space on platforms used by passengers would also help to make passage through station easy and convenient.

W. G. LANDON.

IN JAPAN, all the wooded land is carefully guarded, practically every tree on the government forest land is listed and not one is allowed to be cut down except with express permission of the government, and then not unless another tree is at once planted in its place.—Mountain Echo.

Co-ordination of Railway and Other Transportation

Discussed by Colonel W. B. Parsons, C. A. Morse, F. W. Davis and Daniel Willard

THE FORTY-FIRST ANNUAL MEETING of the American Society of Mechanical Engineers was held at the Engineering Societies building, New York City, on Tuesday, Wednesday and Thursday of this week. In the session devoted to transportation, interesting papers were presented: Transportation on railroads, by Daniel Willard, president of the Baltimore & Ohio; on railroad feeders, by C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific; on motor truck transportation, by Francis W. Davis, engineer of the Pierce-Arrow Motor Company; on terminals, by Colonel W. Barclay Parsons, consulting engineer, and on the New York terminal problem by Gustav Lindenthal, consulting engineer.

Mr. Lindenthal's paper consisted mainly of a rapid sketch of the passenger and freight terminal problem of New York City, particularly as affected by the mile-wide waterway separating Manhattan from New Jersey, and a condensed statement of his proposal to build a single bridge across the Hudson River, at or below 59th street, as being the most economical solution of the river crossing problem.

A Comprehensive Transportation System

By Daniel Willard
President, Baltimore & Ohio

If we are to have a complete and well articulated national transportation system, it can only be had, as things are now, by the co-ordination of a number of different transportation agencies, including the steam and electric railways, the utilization of coastwise and inland waterways, the full economic use of the highways, improved and unimproved, the use of the motor truck, and such other transportation agencies as may be best suited to the particular requirement. Of all the transportation agencies at this time available, particularly for interior service, the steam railroad is undoubtedly the most important.

If this country were fully developed and if we had already reached the peak load which the railroads will be expected to carry, the railroad problem would be a much simpler one than it is under conditions as they actually do exist. Our country has not stopped growing. It is far from being fully developed. Experience of the past demonstrates clearly that at least $1,000,000,000 per annum must be provided as a minimum for capital expenditures for new equipment and facilities necessary to keep the railroads abreast of the transportation requirements of the country. If the government owned the railroads, it could, of course, if the people so desired and Congress so determined, raise, by general taxation, the funds necessary to provide in whole or in part, the additional transportation facilities required, or it could fix rates sufficient to provide either in whole or in part the large sums of new capital needed on that account each year. However, Congress by virtue of the Transportation Act of 1920 has decided that the policy of private ownership and operation of the railroads shall be continued, and has undertaken to provide a plan of regulation to make that policy possible and successful. The owners of the properties, that is the railroad companies, can only obtain new capital providing they can satisfy investors of their ability not only to pay the agreed rate of interest, but can also give satisfactory assurances of their ability to repay the principal sum itself when due.

Congress undoubtedly believed when it fixed the rule for rate-making in the Transportation Act that it had provided a plan that would enable the railroads to establish and maintain a firm basis of credit, sufficient in fact to enable them to raise in the aggregate at least $1,000,000,000 of new capital each year. It was clearly developed during the hearings preliminary to the passing of the act that unless the railroads were able to raise that amount of new capital each year, they would not be able to provide adequate facilities to take care of the business of the country, and in consequence private ownership as an economic policy would fail. The people in this country cannot afford to experiment with or to have any system of ownership or control of the railroads unless such system is able by and of itself to provide, as needed, the additional facilities necessary to move the growing traffic of the country. Personally, I believe the new act will enable the railroads to do this. But if it should develop that the rate of return permitted under the law is insufficient to accomplish the end desired, it will then be necessary either to amend the law so as to provide a more liberal return or adopt some other method. The only alternative would seem to be ownership and operation by the government.

I do not believe that the people in this country as a whole desire government ownership and operation of the railroads. I do believe that they are and will be willing to pay such rates and charges as may be necessary to insure the success of private ownership and operation of the railroads, provided, however, that the railroads under private management are able to give and do give the public such service as it reasonably desires and is entitled to, but if the railroads fail to give reasonable and satisfactory service the public will undoubtedly demand a change.

The condition of the carriers' equipment at the termination of federal control was much below the standard formerly maintained by the railroads under private control. Furthermore, the government had not been able, or in any event did not provide as much new equipment during the twenty-six months of government control as the railroads had been in the habit of providing during similar periods. The result was that when the railroads were returned to their owners they were inadequately supplied with equipment, and such equipment as they had was in an impaired condition while there was a larger volume of business offering for movement than at any time before. The situation was further complicated by the switchmen's strike, which began in Chicago early in April and spread to a greater or less extent over the entire eastern region.

The carriers realizing that they were inadequately equipped to handle the unusual volume of business offering, and appreciating that even if the large amount of new capital necessary to purchase new equipment were available, time also was an element to be reckoned with and some months must necessarily elapse before new facilities could be provided, decided that the important thing to do was to make the best use possible of the facilities already available. With that thought in mind they unanimously pledged their best efforts to increase the daily movement of all freight cars to an average minimum of 30 miles per car per day; to increase the average car loading to a minimum of 30 tons per car, and to reduce the number of cars held out of service awaiting repairs to not more than 4 per cent of the total number of cars owned. If these three standards so set up could all be accomplished concurrently, it would in effect be equivalent to adding over 500,000 cars to those available for service. A number of railroads in the United States

are already making more than an average of 30 miles per car per day, and on a number of lines the average carload is much in excess of 30 tons per car, and on some lines the number of cars awaiting repairs is not in excess of 4 per cent. But the railroads have not yet been able as a whole to accomplish the standards which they have set up for themselves, and it was not expected that the standards would be immediately reached. I am confident, however, that they will ultimately be reached and exceeded. A very marked improvement has already been made. During the month of August the net ton mileage movement on Class I railroads was in excess of 42,000,000,000 ton miles, which was a considerably larger performance than ever accomplished before by the railroads in a similar period of time.

In spite, however, of all that the carriers may be able to do with the existing plant, they will not be able to handle all of the business that this country is even now capable of producing. It should be kept in mind that during the war unusual efforts were made to increase productive capacity in all directions. More ground was cultivated than ever before, and larger crops were raised, existing factories were greatly enlarged and new factories of unprecedented size were built. The productive capacity of the country was thereby greatly increased, for war purposes, it is true, but the development is there and can and will be used largely for peace purposes. During the same period the railroad facilities were not increased at all. In fact, it may almost be said that the capacity of the railroads, that is the carrying capacity, was less at the termination of federal control than it was at the beginning, for the reason that during the entire twenty-six months of federal control the Government bought only about 100,000 freight cars, which was approximately the amount that the railroads had been in the habit of buying during each twelve months' period in the past. The number of locomotives bought during the period of federal control was also considerably less than ordinarily would be purchased during a similar period. No passenger equipment at all was purchased during the period of Government control. It was found that the railroads with their existing plant could take care of the war situation, and properly all men and material available were used in other directions, but in times of peace the people are not willing to accept the character of service which the railroads gave during the war, nor is it in the interests of the people as a whole that they should be required to accept such service. In order that the carriers may be able to properly handle the business offered in the future, they must make very large expenditures not only for additional cars and engines, but for additional running tracks, and particularly for additional terminals.

So far I have assumed that the commerce of the country would depend largely, if not wholly, upon the railroads for transportation. It seems clear to me, however, that it is in the larger public interest that in developing a transportation system which will be adequate to meet the transportation requirements of our growing commerce, each suitable agency of transportation should be used to the extent that it is economically desirable. To be more specific, where a given expenditure, if applied to water transportation, will provide for the movement of the traffic offered at a lower economic cost, including interest on investment and cost of maintenance, than would be the case if an equal investment were made in any other transportation agency, then in such cases the water transportation should be developed. Also, if the use of the motor truck on improved highways in certain localities and for certain distances is shown to be cheaper, including interest on investment and cost of maintenance, than any other method available, then that form of transportation should be made use of under such circumstances.

Personally, I believe that the situation should be studied as a whole and along the lines indicated in the recommendation which I submitted to the Council of National Defense in 1917. Each transportation agency should be used to the extent that such use is economically desirable. To make less use than that of each available agency would be wasteful and uneconomic, and if a more expensive agency were used when a less expensive one might be equally available, that practice would also be wasteful and uneconomic. I think in the past there has been a tendency on the part of those who happened to be interested in some particular agency, to try to extend its use in many instances beyond the proper economic limits, and this has resulted in unwise expenditures which in the end proved to be uneconomic and consequently unprofitable. Such mistakes ought to be avoided in the future.

Again, to be specific, I do not believe that the motor truck as now developed and operating on any form of highway can compete in the carriage of long distance traffic with the steam locomotive running on a steel girder properly supported.

I do believe, however, that for short distance traffic and in sparsely settled communities the motor truck, not only on the improved highway, but even on the ordinary dirt highway, may be used in conjunction with the railway and thus afford the cheapest form of transportation. I think the same thing may be used also with reference to some of our inland waterways. I think there should be an intelligent effort to develop all agencies of transportation, each within its own sphere, but all so co-ordinated with each other as to constitute a nation-wide system which would approximate in its effectiveness the efficiency of the telephone system of which I have already spoken.

Undoubtedly it has happened at different times and places in the past that the railroads have taken business where the out-of-pocket cost, not to mention the cost of capital, has been in excess of the entire revenue. The country as a whole would be better off if such business could be handled in such a way as would give reasonable profits to those engaged in the enterprise. There was a time when railway managers were believed to be opposed to the development of other means of transportation, which might become competitors for the business which they were hauling or desired to haul. But whatever may have been the attitude of the railway managers in the past, that is not their attitude at the present time and I am certain that they will be glad collectively or individually to co-operate with all other transportation agencies in such way as will inure to the greatest public good, because in the end all enterprises of an individual character must be tested by that rule. Whatever contributes to the public good is likely to endure, and anything inimical to the public good is certain to fail.

Feeders for Railroads

By Charles A. Morse
Chief Engineer, Chicago, Rock Island & Pacific

The railroads in this country were originally started as private enterprises and the majority of them started in a small way, and there were as many theories as to development as there were railroads. Unrestricted competition developed abuses and gradually there was developed the theory that railroads were not private enterprises but public utilities; and today the railroads can not raise rates without permission of regulatory bodies.

The operation of the railroads by the Government soon showed that it was lack of facilities and rolling stock rather than private ownership that was handicapping the railroads, and under the new law it becomes the duty of the Interstate Commerce Commission and the railroad managements to make a study of the situation and to see, first, that adequate facilities are provided to give the public the best transportation possible and, second, to see that this is done at the least cost to the public.

In the past, due to unrestricted competition, many facilities have been duplicated, such as tracks from two or more railroads into the same industry, branches of two or more railroads running side by side where one railroad could do double the business done by all. Many branch lines less than 50 miles in length were built to control competitive territory. These were built, as a rule, in the days when all teaming was done with animals. Today, with the advent of the automobile, the motor truck and "good roads," passenger automobiles can travel 25 to 50 miles an hour and loaded motor trucks 15 miles an hour, and in all kinds of weather. The comparatively small cost of motors has permitted their application to single units, so that each unit could be operated independently, and the horse is fast disappearing from road use. With locomotives that require no rails and which can be used by the public at large, the use of the railroad must become less and less as good roads are constructed.

The public is paying for the good roads; it owns the automobiles and motor cars; and now, under the Transportation Act, it must pay for the maintenance and operation of the branch lines of railroads. In many localities the passenger travel on the railroads, especially on slow branch line trains, has been reduced 50 to 75 per cent by the automobile. If the public were required to pay freight rates on the branch line that would pay the cost of upkeep, operation and interest, it would pay as much in many cases as it costs to haul the freight to the main line by motor trucks. The public will have to pay heavy taxes to cover cost of construction and upkeep of its good roads; why should the people in addition to this be obliged to pay in railroad rates the cost of upkeep, operation and interest on the cost of a branch line of railroad which is not needed? With a good hard surface road and no branch line of railroad, some one would operate a motor bus for passengers and motor express for package freight. A careful study should be made of branch lines, and where there are good hard surfaced roads, over which the business now handled by the railroad can be done by motor trucks and buses, the matter of dismantling the railroad should be given serious consideration.

Branch lines were formerly cheaply built, at from $12,000 to $15,000 per mile; they had narrow roadbeds, light rail, light bridges and less ties per rail than main lines; they were equipped with locomotives that had become too light for main line traffic, but handled the short branch line trains. With the constant increase in the weight of the locomotives on main lines for the past 15 years, there are no light engines to put on branch lines, and the result is that what are now perhaps light main line engines, but are heavy for branch line service, are sent to the branches.

This, and the rapid increase in the size and axle load of cars, has meant that the branch lines have had to be strengthened with heavier rail and stronger bridges; more ties to the rail; wider banks and cuts; ballast has had to be applied; with the result that the $12,000 to $15,000 branch now costs $20,000 to $30,000 a mile, with the increased interest charge on the investment and the increased tax on the public to be added to their taxes for good roads.

The cost per ton mile for transporting freight and the cost per passenger mile on the short branch lines are far more than the amount received by the railroad, the result being that the revenue from main line business must be enough to pay for its cost, and in addition must be enough to cover the deficit on the operation of the branch lines.

If many of these branches that are tributary to a territory within the limits of auto bus and auto truck service could be taken up and abandoned, it would mean a reduction in the cost of main line service. Every large railroad has many branches of this kind which do not reach any large towns or connect with any other railroad which could be taken up with economy to the public.

Where branch lines cannot be replaced with motor service and do not connect with other railroads, there should be a rate on the branch that would yield an amount sufficient to cover cost of upkeep and operation, and to pay the required return on the value of the line, there is no reason why the public at large should be required to pay an increased rate on main lines to provide cheap rates on a branch line to accommodate a few people. This is discrimination against the many in favor of the few, but it is one of the things that has been going on in this country for years.

With the completion of such a program there would be large reduction in investment in these useless branch lines, which would go a long way toward taking care of the investment necessary in the construction of lines that are required to develop new territory.

Branch lines are a necessity and it should not be understood that any attempt is being made to belittle their importance, but the transformation that is constantly going on in large cities in connection with suburban train service, by which stations near the center of the city are abandoned, due to rapid transit on elevated railroads or subways, furnishing as good or better facilities, is also taking place where short branch lines are being operated, where the business can be taken care of as well, if not better, by motor cars on hard surfaced wagon roads.

The business of the country is constantly growing and it should be handled by whatever method gives the best service and is the cheapest to the public.

The abandonment of short branch lines of railroads and the delivery of freight at main line stations will mean an increased use of cars, as a car sent to a branch line station means, as a rule, a day going and a day returning to the main line, which is two car days lost for each car, which will be saved if the car is loaded at a main line station.

The abandonment of these branch lines will do away with a lot of small mechanical locomotive terminals, which are expensive to maintain, also many men employed as station agents and helpers on the branch lines, and it will increase the force at many main line stations where better supervision can be given to their work.

Tracks built to a single industry should be owned by the industry served and they should pay all cost of upkeep and all cost of operating the track, the latter as a switching charge that will cover the cost. Where there are tracks that load to several industries these should be limited to a single industrial track, which should be operated by one railroad, and all expense of upkeep and operation should be paid by the industries served by the line. In cities L. C. L. freight should be collected for all railroads at the various stations in the city and should be taken to a central point by one railroad or terminal company, and there made up into carloads and billed over the railroads to which it is assigned. The cost of this service should be kept separate and added to the carload rate from the consolidation point.

Those desiring to deliver L. C. L. freight to the point of consolidation by motor truck would save this special charge for collecting the L. C. L. freight.

The whole matter should be analysed and worked out so that those getting special service pay for that service, and those who do not use the special service but perform a part of it themselves should not have to participate in the cost of this special service.

With the special service paid for separately, there could be a reduced rate for main line service. In the western portion of the country there are large areas that are not within 50 miles of a railroad, where the quality of the land is just as good as that adjacent to the railroad, but which is not cultivated for lack of transportation facilities. With present wastes eliminated, feeder lines could be built into this undeveloped territory. Some of the more prosperous railroads have systematically constructed feeder lines, and

their prosperity under the adverse conditions was largely due to this policy having been carried out for a number of years.

With the requirements of the Transportation Bill that the Interstate Commerce Commission shall pass upon all new extensions, railroads that have undeveloped territory adjacent to their lines which will warrant the construction of feeder lines and increase their main line business, thus reducing the cost per ton mile of all business over the main line, should apply to the Interstate Commerce Commission for authority to construct such lines and for a freight and passenger rate over the new lines that will pay the proper return on the investment and the cost of maintenance and operation of the line.

With the development of the country along a new line, the business will increase, which will permit of a gradual reduction in the rates.

In order to get a uniform treatment for the railroads of the country it looks as though the question of rates, both interstate and intrastate, should be vested in the Interstate Commerce Commission, and that the State Public Utility Commissions and State Legislatures should have no power over railroad rates.

Motor Truck Transportation

By Francis W. Davis

Waterways, where available, present the most economical form of transportation, especially for bulk material. The railways are our main reliance for overland transportation, handling approximately 400,000,000 ton-miles a year. Despite the complexities of their present problems they are discharging a remarkable service, when compared with foreign railway systems. But they are not able at the present time to take care of all the traffic. For various reasons the increase in railway equipment during the past five years has not kept pace with the increase in traffic. To meet existing shortages, provide for retirements and for the normal growth in traffic, it is estimated that the railroads would require in the next three years something like 25,000 passenger cars, 700,000 freight cars, 14,000 locomotives, not to mention side tracks, signals, shop equipment, engine houses, etc. The above requirements will cost five or six billion dollars. It is doubtful if the railroads can add this equipment in that time for two reasons:—first, because of inability to secure the necessary capital, and, second, the impossibility of manufacturing so vast an amount of equipment within a reasonable time; the problem is perplexing.

In the "short haul" and at terminal points where the railways are at a disadvantage, motor transportation comes in as a help, and releases cars for the long hauls, where they are most efficient. The railways and the motor truck co-operate far more than they compete; but where they do compete, as in the short haul, the problem is to determine which is best suited to discharge the service.

The relative cost of shipping by rail and by truck varies by lengths of haul, and other elements, and the point where railway transportation becomes the cheaper is governed by special conditions and no general limit can be given.

With the proper co-ordination, the motor truck can aid materially in lowering terminal and transfer charges. In Cincinnati, 16 motor trucks with 225 unit-container demountable interchangeable bodies are operated in connection with electrically operated hoists at the terminal points, and removing one filled body and replacing with another requires only about five minutes. Under the old system it took an average of 62.4 hours to move freight by trap car between connecting lines, 55.2 hours by trap car between main and sub-stations, and 72 hours by transfer company—an average of 62.4 hours. Now 98 per cent of the freight reaches destination in time for loading into main line cars, or for consignee's delivery at substations within the current 10-hour day. Over 50 per cent has been saved in platform space. Walker D. Hines, Director General, reports in connection with this installation, in addition to quickness of despatch, a "saving of two handlings, 50 per cent decrease in damage to freight in loading and unloading, and decrease of about 15 per cent per ton in cost of handling."

B. F. Fitch, president of the Motor Terminals Company of New York and Cleveland, estimates that the installation of a terminal system in New York City similar to that at Cincinnati would save $45,000,000 in freight costs yearly. It is reported to cost $35 to deliver a car in Manhattan after it reaches the Jersey terminal, while in Chicago it costs approximately $10.35, and in a smaller city like Binghamton, N. Y., $1.80. These are mentioned merely to indicate the great margin for possible savings.

At St. Louis, the Columbia Terminals Company has a transporting operation similar to that at Cincinnati, but uses tractor and trailers, with a fifth wheel and automatic coupling device, permitting great flexibility of operation without necessity for the overhead electric hoists used in Cincinnati, and the transportation of eight to ten tons, instead of five, on each movement.

The railroads are wary of store door delivery because they fear that this may be harnessed on them without adequate increase in rates. Store door delivery, however, is fundamentally sound and represents an ideal toward which we should strive. The motor truck offers the solution. The motor bus should supplement the street railway, very much as the motor truck supplements the railway. The London buses carry more passengers than all the *surface* railway lines of the boroughs of Manhattan and the Bronx in the City of New York. The theory that the car systems in any one of the large cities can be supplanted by a standard size of bus now obtainable is absurd and not worth any serious discussion.

There are, in round numbers, in the United States, 15,000 miles of canal and inland waterways, 260,000 miles of railways, and 2,500,000 miles of highways, outside of municipalities. Approximately twelve per cent of the highways, or about 300,000 miles, are classed as surfaced roads, and would be considered available for motor traffic. Improvements in design of trucks, however, are permitting their use on roads heretofore considered impassable. There are approximately 800,000 trucks in operation. If each of these average five tons a day for 300 working days a year the total tons moved by truck would be about 1,200,000,000. The Firestone Company estimates that certain fleets of from one to forty trucks, all of 5-tons capacity, make an average daily mileage of 40.5 miles per truck.

On a six-mile haul a five-ton truck, with loading time plus unloading time of 60 minutes, would take approximately 95 minutes per round trip and make approximately six trips a day. By reducing the loading and unloading time to five minutes, the truck should make 20 trips a day, an increase of 300 per cent.

As the haul grows shorter, the importance of reducing the loading and unloading time becomes still more accentuated. For a one-mile haul, with 60 minutes loading plus unloading time, the truck accomplished nine trips a day. With a five-minute loading and unloading time, the number of trips is increased to 60, or 660 per cent. With a further decrease of the loading and unloading time to one minute, which is quite possible, the number of trips increases to 90, an increase of 1000 per cent. The increase in the number of trips increases the tons handled and lowers the cost per ton.

The ability of the modern truck to meet difficult road conditions is not generally understood. Today, a good truck will grind its way over poor roads offering a resistance as high as several hundred pounds per ton, and up grades as steep as 20 per cent. The Bureau of Public Roads, Department of Agriculture, is conducting a series of tests on the

relative impact of solid tires and pneumatic tires on motor trucks under all conditions, and also making a study of the relative wearing qualities of different types of pavements and sub-grade materials. This work will have an important bearing on the road construction and truck operation of tomorrow. The ideal in highway development is a comprehensive system of National highway under Federal control.

Terminals and Terminal Yards

By Colcnel William Barclay Parsons

Terminals form the largest item in railway construction cost and the most expensive item of cost in railway operation. A high officer of one trunk line entering New York recently made the guess that perhaps the reproduction cost of the company's end and intermediate terminals, together with equipment, would be as much as all the balance of the road with its equipment, does it seem unlikely that 30 per cent of the physical valuation of the railways in the United States would be represented by terminals and terminal yards? As to operation there is no segregation of cost figures that will give a reliable estimate. Can it be safely put as less than 30 per cent (average)?

No matter what is the actual figure, it is certainly very great and at times such as these when the total cost of transportation is one full of worry for the officials of transportation companies and the shippers, it is well worthy careful consideration and scientific investigation by both classes. But considering that the terminal operating cost forms so great a part of the total transportation expense, perhaps a greater part than any other item, it is a field full of hope, if not of promise for finding substantial economies.

Not long since a committee of the American Railway Engineering Association on Yards and Terminals stated in an official report that "the united operation of railroad terminals in large cities is one of such importance that it could well engross the best efforts and thoughts of the Committee."

The terminal cost is not limited so far as the man who pays the freight is concerned to the extent of passing cars through a terminal yard and the unloading of goods through freight houses. To the consignee, although his place may be quite near by, his consignment, as long as it is in a railway freight house, is still far distant. We must get it and under the present authorized method of charges must get it promptly and remove it to its destination.

Again, the author would like to give figures as to such cost of final delivery, but conditions vary so much in different cities that no reliable statistics can be given. In one investigation, in New York, the cost of trucking from the railway freight house to the consignee's warehouse was found to be as much as 80 per cent of the whole railway charge for carriage from Buffalo or Pittsburgh to New York. Place any figures you like within reason as the part of the total railway charge that should be allocated to the cost of passing a car through a New York terminal yard and the unloading of the goods, it is evident that it costs much more to handle a ton of freight through New York to the point of ultimate destination than it does to haul that same ton some 400 miles, including in the latter expense the cost incurred in handling the goods in the originating and intermediate terminal yards.

There was a time when this question of railway terminal charge was largely one of dispute between shipper and railway companies. At strongly competitive points the companies held rigorously to any special convenience of advantageous location that they might enjoy to the exclusion of other lines, or made rates below a fair distribution of cost, charging the necessary excess at other points to compensate for the loss at the competitive points. Such practice was not just to anyone concerned. Today competition is, to a great extent, removed, and there is established the base principle that terminal rates must be not only geographically equitable, but should be so fixed by governmental authority as to give a minimum net return which is also substantially a maximum net return on physical valuation, but the managers still make every effort to obtain business that is profitable, though they must see that rates are not raised so as to check traffic, and the shipper, like the railway manager, is directly concerned to see that economy is secured. The shipper can aid by focusing public attention on unnecessary burdens placed by legislation or the failure of the transportation companies to use their properties in the best manner. Public authorities must co-operate with the transportation companies and with each other. This last point is important because frequently public authorities fancy that their local interests clash, in which case both the transportation companies and the shipping public are the sufferers. These and other similar evils can be corrected by the great weapon of public opinion provided it is only properly instructed and well directed. The capital invested in terminals and terminal yards is probably 30 per cent of all railway capital, and the cost of operation is perhaps as high a proportion of the total operating cost. Manifestly, there is something worth attacking. Every reduction in cost of terminal operation, therefore, will result in a sensible reduction in operating expense, which reduction inures first to the benefit of the shipper and only to the benefit of the company when the critical point is reached, that is, when an increase in rates no longer produces an increase in gross returns.

How can savings in terminal expense be obtained? Is there not great waste in duplication of service and in the use of badly located facilities? In the old competitive days it was necessary for each company to have its own complete terminals, and to prevent competitors from obtaining facilities as ample or so well located. There resulted, consequently, as many terminal yards as there were companies and frequently each terminal yard had its own separate arrangement for the handling of every class of commodity, such as food stuffs, dairy products, general merchandise, fuel, etc. If all the railways in any large American city had been combined, would the manager of such a combined system have maintained, for a moment longer than necessary to complete the physical changes, the previous methods of duplicated service? Under the present law the systems are not actually combined, nevertheless the cut-throat competition has been removed, and the companies are not only free, but are encouraged to eliminate wasteful duplication. The Chicago Terminal Commission has already answered this question by saying that "there are decided advantages in co-operative operation." In 1918, the railways of the country began co-operative operation, and in the northwestern, central-western and southwestern sections, covering 28 states, annual savings amounting to $5,750,000 were shown. Although only the surface has been scratched, would there not be really great savings if all the terminal facilities in all our cities should be pooled and duplication be avoided?

How can terminals be more economically operated is another question. Many of our passenger terminals are seriously over-burdened, and yet on account of surrounding urban development the facilities cannot be enlarged. The man in the street as a commuter, seeing our great stations crowded morning and evening, is impressed with the great business and with the skill with which it is handled, but does not realize that the splendid facilities which are used at our passenger terminals are operated at full load for only four hours a day. The electric locomotive does not have to be taken to a round-house after a limited performance, and with it the use and consequent extent of intermediate terminals could be diminished. What can the shippers do? High demurrage charges rigorously enforced have greatly reduced waste of cars, but in fairness to all parties this should be stopped entirely. There is perhaps only one way in which this can be done, and that is by store door delivery. The operation of

London's freight terminals impresses one with the huge amount of business done on small areas. At about 3 a. m. incoming freight begins to arrive at each freight station. By 7 a. m. the freight house and delivery tracks are full. Then an army of railway drays attacks the ordered pile of merchandise and by noon everything has been removed and delivered to the consignees. At 4 p. m. out-going freight begins to arrive by drays. By 8 p. m. the freight house is full again, but by midnight the contents will have been loaded into cars. Buildings, drays, tracks, plant and men are all worked to maximum efficiency.

New York's terminals are really the affair of the whole country. In what can be called the Metropolitan district embracing a part of New Jersey, as well as the City of New York, there are located nearly one-twelfth of the whole population of the United States, and this same district is the greatest manufacturing center of the United States. Not only can no one city be compared with it, but no one state. More persons are employed, more wages paid, and the value of the products is greater than the similar figures for the whole state of Pennsylvania. In addition to this 40 per cent of the export and import traffic of the whole country passes through the port, and there is a large tonnage received in New York to be distributed coastwise by vessels east and south. This export tonnage lays a serious handicap on terminal operation. It is rarely that cargo can be sent on arrival direct to the vessel's side; it must be held on cars awaiting ship. Such demurrage is permissible by rule. Every railway coming from the west maintains on the Jersey shore great yards occupying valuable space, and no less than 25 per cent of Manhattan dock front is occupied by railway terminals, or landing places where no one does business, but to which and from which the city's incoming and outgoing merchandise must be trucked daily. Is this necessary? Should not the terminal facilities of the several roads be pooled, thus concentrating operation on the part of the railways? Instead of maintaining special delivery stations in New York, can there not be a combining there, with perhaps a further segregation into places for delivery according to commodities?

Should the question of unified operation be answered affirmatively, and also the question of store door delivery, then another question: "Why adhere to the water front yards and points of delivery?" New yards with switching connections at both ends can be constructed with modern freight houses and unloading tracks equipped with freight handling, labor-saving machinery. These could be located in any convenient place, even on the wide expanse of the Jersey meadows. To them motor trucks with trailers, carrying not part but full loads, would transport merchandise between cars and points of origin or destination in any part of the Metropolitan district. Already New York's harbor terminal facilities are over-taxed and there is danger of surplus foreign traffic seeking against natural laws other and consequently less well-situated ports.

The Government and Inland Waterways

By Frank T. Hines
Late Brigadier General, U. S. A., Chief of Transportation, Inland & Coastwise Waterways Service.

The presence of the federal government in an operating role on inland waterways, long after the railroads have been turned back to private ownership, has caused opponents of government operation of public utilities to ask if the implied intent of the Transportation Act in this connection is not being evaded; but the work which the government is now doing is actually paving the way for profitable private operations on those waterways. After several weeks of intense study, the Committee on Inland Waterways recommended the acquisition by the government of all suitable existing floating equipment and the construction of such additional boats as conditions demanded. The Director General of Railroads, commandeered all available privately owned craft, and set up the necessary operating organizations. At the same time the construction of fleets of larger and better barges and towboats was undertaken.

For the Mississippi River between St. Louis and New Orleans, this building program called for 40 barges of about 2,000 tons capacity each and six towboats. With this and other incidental equipment, estimated to cost in all about $6,500,000, it was believed that net earnings in the neighborhood of $1,000,000 per year could be secured, or an income equal to at least 15 per cent on the investment.

For the Warrior River, 20 wooden barges and three towboats were contracted for, designed especially for bringing coal down from central Alabama to Mobile, and contracts were let for four self-propelled barges, staunch enough to proceed directly through the Gulf of Mexico to Violet, La., with coal for New Orleans. This equipment was estimated to cost $1,500,000, but it was believed that these boats could easily be made to earn a substantial revenue on the initial investment. For the New York Barge Canal, the contracts let by the Railroad Administration, called for 21 concrete and 51 steel cargo barges, each of about 500 tons capacity on a 9-ft. draft, and for 20 barge towboats each having capacity for 300 tons. With this latter fleet, costing about $4,000,000, it was estimated that sufficient operating revenue from the movement of eastbound grain alone could be secured to pay, at the outset, about 15 per cent on the initial investment.

As a matter of actual fact, none of these earnings originally estimated as possible have to date been produced by these boats. However, it is doubtful if the knowledge of this fact would have deterred the Railroad Administration from entering upon this boat-building program. Peace seemed distant and victory demanded facilities for unlimited transportation. . . . The government eventually requisitioned about 250 canal boats of the old Erie Canal type

On none of the lines were the results obtained at the start as satisfactory as had been hoped for. Still, a tangible beginning in waterway transportation on a large scale had been made, while the tonnage actually transported on these inland routes resulted in materially relieving the railroads. The maintenance of these lines by the government has been a hard, up-hill fight. In no instance have they, until the present summer, shown actual operating profits in any one month. Construction of the new equipment, particularly power units, has been delayed far beyond the original delivery dates, and it has been necessary to use old boats necessitating exorbitant operating costs. On the service between New Orleans and St. Louis, the average monthly deficits up to October, 1920, have been about $50,000. On the Warrior Line, they everaged over $30,000 each month. On the New York Barge Canal, however, with the delivery of the new types of power units, actual profits have this year, for the first time, been earned. For the whole, year, however, taking into consideration the five months during which these boats must be tied up, the total earnings will be little more than the expenses.

Congress has already appropriated $2,000,000 to be spent within the next year in building necessary terminals particularly along the Mississippi and Warrior Rivers for the handling of waterway freight. Once these individual lines have reached a stage where they are actually producing profits, the physical operation may well be given over to private ownership on much the same basis as the Shipping Board is disposing of its war emergency fleets. Until that time, however, the money spent by the government in pioneering the way toward profitable large-scale waterway transportation may be considered as an investment which will in the near future bring splendid returns.

The American Railway Association—Signal Section

Large Attendance at New York Meeting—Proposal to Hold Annual Meeting in June—Many Reports

THE SIGNAL SECTION—heretofore the Signal Division—of the American Railway Association held its regular meeting, the seventh since the former Railway Signal Association became a part of the American Railway Association, at the Hotel McAlpin, New York City, on December 2 and 3, with an attendance of about 300. F. W. Pfleging, (U. P.) chairman of the Section, presided, and H. S. Balliet, secretary of the Section, acted as secretary of the meeting.

On recommendation of the Board of Direction, the meeting instructed the secretary to send out at once a letter ballot on a proposal to change the time of holding the "stated" meetings so that they will come in March and November, and to hold the annual meeting in June. If the change is approved, it will go into effect in 1921. When the annual meeting is held, as now, in the month of July, there is not sufficient time to prepare the record of proceedings and secure the necessary letter ballots in time for presentation to the annual meeting of the American Railway Association in November. The month of June also has an advantage over July in the better chances of securing a suitable meeting place.

The Board of Direction proposed, and the meeting approved the proposal, that the sectional or district meetings of members should, as a rule, be held not more than four times a year. There was objection to this on the ground that maintainers, for whose benefit mainly the meetings are held, cannot always accommodate themselves to the dates appointed; they ought to have more opportunities in the course of a year so that if one meeting is missed special effort can be made to be present at the next one. The quarterly rule prevailed, however, by unanimous vote. Many of the committeemen, who prepare material for the district meetings, feel that with less frequent meetings more interesting programs could be provided.

The Committee of Direction has appointed a committee to confer with the president of the American Railway Association on the subject of the relations of this Section to the Association, the letter ballot, taken since the July meeting, having shown a large majority in favor of the proposal presented at that meeting. On this letter ballot the number of active members voting was: 285 affirmative and 12 negative; junior members 20 affirmative, no negative; associates 102 affirmative, one negative.

The secretary announced that the March meeting would be held at the Congress Hotel, Chicago, on Monday and Tuesday, the 14th and 15th.

The secretary announced that all of the 67 subjects referred by the July meeting to letter ballot had been approved, the total number of votes cast being 1,064. On most of the subjects the vote was nearly or quite unanimous; but on certain propositions of committee No. 5 and committee No. 9 there were considerable minorities. On questions for maintainers concerning track circuits, the negative vote was 83. The various specifications for rubber-covered wires and cables, aerial and submarine, received from 297 to 353 negative votes, and in some cases the majority in favor of the specifications was only one more than the necessary two-thirds.

Committee No. 3, Power Interlocking, F. B. Wiegand (N. Y. C.), chairman, through a sub-committee, of which B. J. Schwendt (T. & O. C.) was chairman, asked for instructions concerning the views of the membership in relation to a proposed specification for wiring for electric interlocking; and this brought out a long discussion on various phases of laying wires, the merits of single conductors versus cables, etc. The committee proposes to provide rules for use with all classes of interlocking; to prescribe multiple conductor cable as extensively as practicable and to limit the use of wood trunking. The main purpose of the committee, so far as developed, will be to recommend the best practice in only a few general lines, with a view to doing away with the excessive variety in practices which now is general.

W. H. Elliott (N. Y. C.) is opposed to the use of aerial cables for controlling circuits, believing also that their cost is greater than that of single wires.

J. C. Mock (M. C.) believed single wires the more expensive.

W. M. Post (Penn.), reviewing his experience with underground wires and comparing with aerial, found many points, especially from the maintainers' standpoint, more favorable to aerial construction.

F. P. Patenall (B. & O.) reported satisfactory results from the use of home-made cables which have been in service eight years.

W. H. Elliott (N. Y. C.) told of experience with a cable between Albany and Buffalo, 300 miles long, in use since 1892. The most troublesome feature with this cable is the occurrence of occasional crosses of wires in the cable which are caused by sportsmen (or boys) who perforate the cable with shot.

A. H. Rudd (Penn.) has made plans for electric interlockings at single track grade crossings, with all connections to be made by cable, which he believes will prove economical.

G. H. Dryden (B. & O.) cited the practice of the Western Union Telegraph Company as favorable to the increased use of aerial cables in place of single conductors. The Western Union has lately put in service, between New York and Washington, about 224 miles, a cable containing 30 or 40 conductors. It has been reported that the old wires, which were sold, paid the cost of this new cable.

A. H. Rudd (Penn.) for trunking, favored wood, fireproofed and sanded, properly painted, and protected where necessary by a beveled top. This ought to last twenty years. In running beneath tracks the lumber should be creosoted and have a metal cover.

W. H. Elliott (N. Y. C.) uses concrete trunking, believing this the only proper substance to properly resist fire where the line has to be laid in cinders. The life of concrete is longer than that of cypress.

Committee Reports

Aside from the foregoing, the time of the several sessions was devoted wholly to the consideration of committee reports, all of which were in the nature of requests for criticisms and further information, with the view of revising the reports for presentation to future meetings and finally to the annual meeting. The Section for the time being resolved itself into a committee of the whole, and the discussions were informal.

Committee No. 12, R. C. Johnson (B. R. T.), chairman, presented a form of contract for block signal and interlocking work which, after brief discussion, was approved; also a form of invitation to be sent to prospective bidders and a form of bond. On these a number of suggestions were made to the committee.

Committee No. 2, C. J. Kelloway (A. C. L.), chairman, presented a revision of the specification for mechanical interlocking machine, style "A" locking, which, after the presen-

tation of numerous criticisms and suggestions, was approved. The same is true of a number of designs presented by this committee and of a specification for concrete trunking.

Committee No. 3 presented a specification for a circuit controller for drawbridges which, after brief discussion, was returned to the committee for revision and submission to the annual meeting.

Committee No. 4, C. F. Stoltz (C. C. C. & St. L.), chairman, presented a revision, filling about 20 pages, of a specification for direct current automatic block signaling, and a revised drawing, No. 1,086, of a channel pin, in which the allowance for variation in dimensions is a little more liberal than that provided by the present standard. This was approved, and the proposed specification, after a long discussion and numerous criticism, was left in the hands of the committee to be prepared for the next meeting.

Committee No. 6, F. P. Patenall (B. & O.), chairman, presented a number of standard designs including a dwarf signal and details, a round target to give the day indication on a lamp, and an electric lamp case; also a list of gages for sheet metal and wire. The dwarf signal, with spectacles below the arm, was sharply criticized and the relative merits of different designs were discussed at some length; but the design presented (page 108, of the program) was finally accepted.

This committee presented a tentative report on electric lamps, asking for criticism. This report was prepared following a discussion held by railroad men and manufacturers at Ogden, Utah, on August 28. The committee expects to make drawings to go with the report, and to present the whole at the March meeting. The committee took under consideration a large number of objections made by members.

Committee No. 10 presented, through F. P. Patenall, chairman of a sub-committee, a proposed brief code of rules on the application of an aspect indicating that a train must take the siding at a non-interlocked switch. This was submitted for discussion, but it was not discussed and apparently was tacitly approved.

Committee No. 8, C. H. Morrison (N. Y., N. H. & H.), chairman, presented a report containing information for calculating power supply and distribution for an alternating current signal system, the presentation of the matter in this way having been decided upon, by the committee, as more suitable than to attempt a rigid specification, as had been the expectation when the subject was assigned to the committee. The report was tentative and was left in the hands of the committee for revision. Numerous suggestions were made by members, including one that steel-cored aluminum wire is superior to copper as a conductor. In view of the strength of this wire it was suggested that poles might be set farther apart.

Committee No. 13, P. M. Gault, chairman, presented a code of rules for testing electric motor signals in service (bottom of mast, first range, d. c. push clear type), and a specification for portable a. c. volt meters. These, after brief discussion, were approved for presentation to the annual meeting.

Seven committees made brief informal reports of progress. Committee No. 9, Rubber Covered Wire, is holding conferences with the Bureau of Standards, Washington, and with the Massachusetts Institute of Technology. Committee No. 15, Valuation, is working on various subjects. The discussion brought out a strong demand for a report from this committee to guide railroads in making a suitable classification and suitable adoption of units for signal material in giving orders for new work. There is much diversity of opinion as to the right course to pursue. Committee No. 7, Direct Current Relays, reported progress. Committee No. 16 is considering a specification for making better oil for use in long time burners. This committee was instructed to assign numbers to its specifications for lubricating oil. Committee No. 17, on Pole Lines, is working in conjunction with a committee of the Telegraph & Telephone Section.

Committee No. 18, D. C. Track Circuits, expects to make a report at the March meeting. A questionnaire is to be sent out for information concerning insulation, resistance, etc.

Committee No. 5 reported progress and is working on rules for maintainers covering the use of motor cars, oil lamps and maintenance of storage batteries. A report will be presented at the March meeting. Various suggestions were made concerning the best method of arranging rules, questions and answers.

St. Paul Leases C. T. H. & S.

THE CHICAGO, MILWAUKEE & ST. PAUL has leased the Chicago, Terre Haute & Southeastern, running from Chicago to Westport, Ind., a distance of 374 miles, and passing through the southern Indiana coal fields, for a period of 999 years. Under the terms of the lease the St. Paul guarantees the payment of $18,465,000 of bonds and will pay $10 per share for the 43,000 shares of outstanding capital stock. The final details of the transaction have not yet been fully worked out; however, F. O. Wetmore, vice-president; M. J. Carpenter, president, and B. A. Eckhart, director of the Terre Haute, will form an executive committee to complete the arrangements.

The acquisition of this line by the St. Paul will give the latter line access to the unlimited coal supplies produced in the southern Indiana bituminous fields. The location of the St. Paul has heretofore interfered with the accumulation of adequate coal stocks. Now, however, it is believed that this difficulty will be overcome and the St. Paul, instead of having to depend upon connecting carriers for its coal supply, will be amply supplied on its own lines.

The Terre Haute was incorporated in Indiana in November, 1910, taking over the properties of the Southern Indiana and the Chicago Southern, both of which roads were in the hands of the receivers and were sold to the new company under foreclosure. In 1913 a lease with the Baltimore & Ohio Chicago Terminal was agreed to, giving the Terre Haute two terminal connections into Chicago.

Approximately 90 per cent of the road's traffic is in coal, passenger service being maintained only between West Dana, Ind., and Westport. The company has in operation 72 locomotives, 64 passenger cars and 6,859 freight cars, practically all of the latter of which are coal and flat cars.

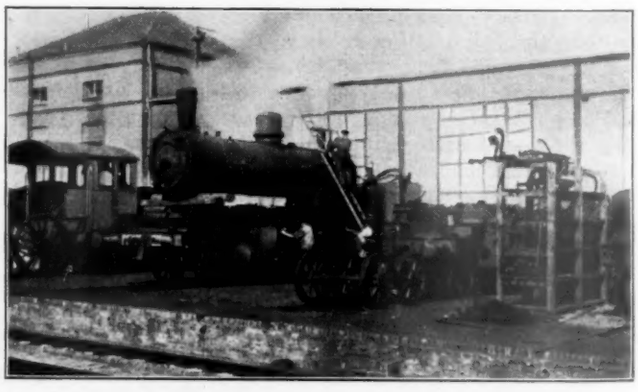


Photo by International

Locomotive Plant at Spandau, Germany, a Portion of a Former Munitions Factory

Lehigh Valley Modernizes the Laying of Rail

Increased Output Secured and Costs Reduced by Adoption of Improved Labor Saving Equipment

THE PROBLEM of laying new 100 to 136 lb. rail on a modern railway is not by any means a routine matter though in many cases it has been handled along those lines. Large numbers of men are usually employed for this work where any considerable amount must be laid and in general the unit cost has been high because of the uneconomical methods which it is necessary to employ. In order to reduce this cost to a minimum and at the same time to speed up the amount of rail laid in a given time the Lehigh Valley has developed a method in which there has been incorporated the use of such labor-saving equipment as locomotive cranes, air compressors, and drills, etc. As a result daily averages have been made and are now being made of from 80 to 110 rail lengths per hour, all completely bolted, spiked, etc., and ready for service, while in special instances as many as 159 rails have been laid in one hour.

In conducting this work the necessary labor has been secured by assembling the section forces employed in the locality where the rail is to be laid. The work is then so planned as to be carried on in a series of progressive stages or steps, such as, pulling spikes, throwing out old rail, etc., each step being assigned to a required number of men. In practically all but a few cases the individual gangs or sub-divisions of the forces are composed of section gangs complete with their foremen or multiples thereof. The foremen work with their men as well as supervise them. This feature in itself has been found to speed up the work materially.

With the forces and equipment assembled and all assignments understood the track upon which rail is to be laid is taken over completely and operations commenced. During the period of laying the remaining track is operated as a single track section. Through the close co-operation of the operating department little delay has been caused by the adoption of this method, even under comparatively heavy traffic. It is a question whether or not the delays caused by laying rail under traffic do not equal or exceed the delays when the track is given over entirely.

As stated before the method is based on progressive steps with all new materials distributed previously along the section to be laid. The old track is not disturbed under any circumstances until the time when it is taken over. The sequence of the various stages is in general as follows: Joints are broken every 10 rail lengths, spikes pulled, one rail thrown out, old tie plates removed, creosoted wood plugs placed in old spike holes, ties adzed, new tie plates placed, new rail laid with locomotive crane, rail center spiked and gaged, joints placed and bolted, holes drilled and bond wires installed, track gaged and full spiked, signals connected up and work generally finished up. Where one crane is used a force of about 200 men are required to keep the crane working to its capacity and the work proceeds one rail at a time, the crane being moved back to the point of starting at the completion of the laying of the first line of rail and starting on the second rail. With two cranes a duplicate organization follows the first crane preparing the other rail for the second crane, both of which are followed by a finishing gang of about double the size.

Rail bonding is carried on by means of portable units of air compressors and their drills. One compressor generally handles four drills requiring a crew of six men. The saving of labor in this item has been very marked and a much greater output has been obtained in addition to increasing the life of the drills from five to eight times. In connection with this class of equipment several pneumatic wrenches were

Modernizing Rail Laying on the Lehigh Valley

1. Throwing out old rail. 2. Preparing the ties for the new steel. 3. Locomotive cranes laying new 136-lb. rail. 4. Running up track bolts with pneumatic wrenches. 5. A typical outfit for drilling bond wire holes.

tried out recently for the purpose of running up the nuts on the track bolts. The average time consumed for running up one 6-bolt splice and moving to the next was about 30 seconds.

Figuring on a one-crane basis, as any multiple up to four can be used efficiently on one set of tracks provided there are sufficient men available, the following is a typical organization in detail: The men comprising this organization are listed in the exact sequence under which they pass over the track.

A Typical One-Crane Organization

ADVANCE WORK

3 men removing every tenth joint on the old rail.
24 men pulling spikes. This includes 2 foremen.
14 men swinging out old rail. Two foremen with section gangs.
3 men throwing out old tie plates.
3 men placing creosoted tie plugs in spike holes.
2 men driving creosoted tie plugs in spike holes.
12 men adzing ties. One section foreman included.
2 men sweeping off ties after adzing.
5 men placing new tie plates. One foreman included.

This covers the preparatory work for the crane which has the following organization:

4 men on rail, two on each end to steady and guide it into place.
1 man on crane hook. The foreman in charge of crane forces.
1 man on expansion template.
2 men driving spikes on inside of new rail.
2 men driving spikes on outside of rail after laid.
1 man with lining bar to bar rail to place as laid.
2 men operating crane. The operator and fireman.

The locomotive crane was followed by the following gang:

1 man adzing joint ties for a 1 to 20 cant.
10 men placing new joints. Two foremen included.
5 men removing rail anchors from old rail.
1 man placing insulated joints.
12 men gaging new rail.
34 men full spiking.
30 men bolting up joints

This was followed by the bonding layout and the finishing gangs:

4 men operating air drills.
2 men operating motor cars and distributing bond wires.
1 man operating air compressor.
2 men bonding new rail.
5 men clearing out for rail anchors. One foreman included.
5 men placing new rail anchors. One foreman included.
2 men operating motor cars, two trailers with extra tools, etc.
3 men checking up on tie plates, spiking and joints, etc. One foreman included.
3 men carrying drinking water.
1 man changing wire at signal connections.
1 man soldering signal connections.

With the experimental introduction of the pneumatic wrenches the organization was changed slightly from that shown above, the 30 men assigned to bolting being removed and the following substituted for them:

2 men on pneumatic wrenches.
1 man tapping joints into place.
1 man on air hose.
1 man operating motor car.
1 man operating air compressor.

In the particular instance mentioned above a stretch of track between two switches located nearly 2½ miles apart was laid with 136-lb. rail in a total elapsed time of 7 hr. 10 min., or at the rate of 107 rail lengths per hour for a total of 770 rails. The force shown totals up to 205 men in the first case and 180 men with the introduction of the wrenches.

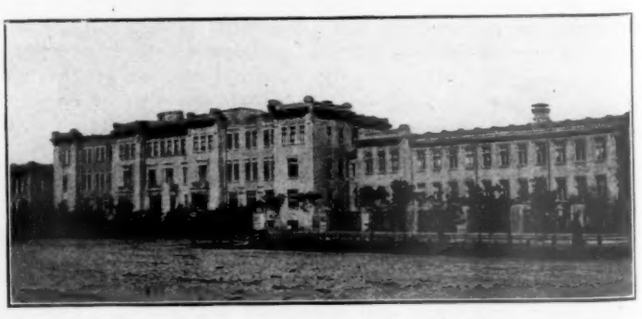
Treasury Files Mandamus in Guaranty Case

Washington, D. C.

The Secretary of the Treasury on December 7 filed an answer to the mandamus proceedings instituted by the Grand Trunk Western to compel the Treasury to honor a certificate for $500,000 issued by the Interstate Commerce Commission on account of the road's guaranty for the six months following the termination of federal control. This is a test suit filed in the Supreme Court of the District of Columbia in an effort to collect approximately $400,000,000 remaining unpaid of the guaranty for all the roads. The Secretary in the answer pointed out that the guaranty provisions of the law contain no authority for partial payments on account of guaranty except the advances which were to be applied for by September 1 and that the wording of the paragraph seems to indicate that only one warrant is to be drawn for the claim of each company after a final audit and certificate from the commission. It was argued that mandamus will lie only to compel the performance of a clear and imperative duty and with the intent of Congress apparently against the relief asked, with an adverse ruling from the comptroller, the Secretary submits that no case of a clear and imperative duty has been made out and that the writ should be refused. It is understood that counsel for the railroad will ask that hearing on the petition and the answer be set down for December 16.

The petition filed by the railroad says: "The extended nature of the accounting necessary to determine what does, and what does not, enter into railway operating income makes it certain that many months will elapse before the Interstate Commerce Commission can ascertain and certify to the respondent, the Secretary of the Treasury, the final amount due the relator under the guaranty of railway operating income provided in said Section 209 of said Transportation Act, 1920. In the meantime, a specific amount, that is to say, Five Hundred Thousand Dollars ($500,000), certainly due the relator, has been ascertained and certified by the Interstate Commerce Commission to the respondent under Section 209 of said Transportation Act, 1920, leaving for further ascertainment and certification such additional amounts as may be due the relator. By reason of the refusal of the respondent, the Secretary of the Treasury, to draw a warrant upon the Treasury of the United States as above recited, the operating expenses of the railroad and system of transportation of the relator are accumulating, and serious operating difficulties are threatened because of a lack of funds to meet operating expenses, so that the injury to the relator by the failure to obtain at once the amount of money definitely ascertained by the Interstate Commerce Commission and certified by it to the Secretary of the Treasury as above recited to be due the relator by the United States under the guaranty of railway operating income under said Transportation Act, 1920, will be irreparable.

"That the Interstate Commerce Commission having ascertained and certified to the respondent, the Secretary of the Treasury, that the sum of Five Hundred Thousand Dollars ($500,000) is an amount necessary to make good the guaranty to the relator, Grand Trunk Western Railway Company, as provided by Section 209 of the Transportation Act, 1920, the relator is advised and therefore avers that the said respondent, the Secretary of the Treasury, was and is without discretion in the premises, but it was and is the plain duty of the respondent to draw a warrant in favor of the relator, Grand Trunk Western Railway Company, upon the Treasury of the United States for the sum of Five Hundred Thousand Dollars ($500,000), and to deliver the same to the said relator, but the said respondent has utterly failed, neglected and refused, and still fails, neglects and refuses, so to do, although requested."



General Offices of the Chinese Eastern Railway at Harbin, Manchuria

Annual Report of Interstate Commerce Commission

Review of Year's Activities Under New Law, Including Exercise of Emergency Car Service Powers

WASHINGTON, D. C.

THE ANNUAL REPORT of the Interstate Commerce Commission for the year ending October 31, made public on December 9, in addition to the usual routine report of the activities of its various bureaus, contains an interesting review of some of the principal developments of the year affecting the railways and particularly of the transportation conditions which required the commission to exercise its emergency powers over matters pertaining to car service. The commission's recommendations to Congress are summarized as follows:

1. That provision be made to authorize and require certification and payment of partial amounts under sections 204 and 209 (g) of the transportation act, 1920, and to authorize the making of a reasonable estimate of the net effect of deferred debits and credits to railway operating income, and the use of the resulting amount, when agreed to by the carrier, in making final certification of the guaranty under 209 (g) of the act.

2. That section 1 of the interstate commerce act be amended to provide for the punishment of any person offering or giving to an employee of a carrier subject to the act any money or thing of value with intent to influence his action or decision with respect to car service, and to provide also for the punishment of the guilty employee.

3. That the boiler-inspection act, as amended, be further amended to provide for increases in the number and salaries of inspectors.

4. That appropriate legislation governing the transportation of explosives and other dangerous articles as outlined elsewhere in this report be enacted.

For the reasons stated in previous annual reports, we renew our recommendations to the effect:

5. That the power to award reparation be placed wholly in the courts; that a condition precedent to an award of reparation by a court for unreasonable rates or charges be that we have found such rates or charges unreasonable as of a particular time; that the law affirmatively recognize that private damages do not necessarily follow a violation of the act; that provision be made that sections 8, 9 and 16 of the interstate commerce act shall be construed to mean that no person is entitled to reparation except to the extent that he shows he has suffered damage; and that the law should provide that if a rate is found to be unreasonable the rule of damages laid down in the International Coal Case, 230 U. S., 184, should control.

6. That the use of steel cars in passenger-train service be required, and that the use in passenger trains of wooden cars between or in front of steel cars be prohibited.

Partial Abstract of the Report

The following is a partial abstract of some of the principal items of the report. The remaining part of the abstract will appear in next week's issue.

Exercise of Emergency Powers

Under the transportation act, 1920, we were given enlarged powers with respect to car service. A short review of the critical period through which we have passed may well precede a statement of the steps taken under the emergency powers thus conferred.

Bureau of Service

For the purpose of handling informally the numerous car service matters which are brought to us, and of enforcing the various orders made by us under such powers, we organized a bureau of service soon after the termination of federal control. That bureau is in constant and daily touch with carriers by railroad both through their car service division and directly.

Following the armistice, until August 1, 1919, there was for the most part a surplus of cars. Since August 1, 1919, the revival of industry, has resulted in a demand for cars which has continually exceeded the available supply. Such was the condition on February 29, 1920, at the termination of federal control, and to a lesser extent is the condition now. That condition was accentuated to some extent by bad weather which lasted until after April 1, 1920, but was enormously magnified after that date by strikes which began early in April and lasted well into the summer. These strikes greatly augmented congestion at many important gateways and terminals and necessitated the placement and maintenance of numerous embargoes. Hundreds of thousands of cars were held stationary. In effect it was as if about 750,000 cars for the time being had ceased to exist as facilities of commerce. The April congestion caused by the strikes had the effect of reducing by fully one-third the equipment available as compared with that available on the resumption of private control.

The latest general statistics show that railroads under our jurisdiction own approximately 2,368,876 freight cars used in revenue service, of which 1,062,836 are box cars, 1,009,871 open-top cars with sides, 107,824 flat cars, 83,000 stock cars, and 60,204 refrigerator cars, and 45,141 miscellaneous cars. In addition there are many privately owned tank cars, coal cars, stock cars, and refrigerator cars which bring the total freight cars on railroad lines to approximately 2,500,000. During federal control the director general purchased approximately 100,000 freight cars and 4,226 locomotives, which have since been taken by the railroad corporations. Against these additions to equipment must be placed the offset of equipment retired during federal control. With the return of the railroads to their owners, the problem was forced upon the carriers and upon us as to how the demands of commerce for the movement of an extraordinary amount of tonnage could be met with an impaired transportation machine. This difficult situation was soon complicated by widespread strikes and cessation and diversion of railroad labor. The effects of a shortage of equipment can be minimized by increasing transportation efficiency and by car conservation. This end has been sought unceasingly by us, though it is clear that the problem can not be solved without substantial additions to equipment.

In anticipation of the return of the railroad properties to their owners, the railroads, acting through and by the American Railroad Association, promulgated a code of car-service rules, effective March 1, 1920. Cars have been distributed primarily without regard to ownership. The movement of traffic has been the first consideration. So far as not incompatible with the movement to traffic, efforts were made even during the acute period of congestion to move the scattered cars toward their home lines.

The railroads, realizing the necessity for fair and equitable distribution of cars, voluntarily established a car service division of the American Railroad Association, with offices at Washington, known until September 3, 1920, as the "Car Service Commission" and thereafter as the "Car Service Division." This agency began functioning upon the termination of federal control. By voluntary action of the carriers that division has been given power to issue directions to them in the matter of car distribution, which they have undertaken to follow. It also acts as the statutory agent for the members of the association in receiving service of orders entered by us; and, by its officers and committees, speaks to us the collective voice of its constituents as to all matters of car service. On November 1, 1920, the situation had so improved that the car service division of the American Railroad Association pointed out to its members the necessity for bringing about an orderly return of home cars and a general application of equalization rules, as warranted and necessary to avoid possible future confusion, and in anticipation of a prospective surplus of car supply. We have cooper-

ated with the railroads in transportation matters through that agency.

On May 15, 1920, the principal rail carriers filed with us an informal petition in which they stated their urgent need for additional freight cars and locomotives; that there was no immediate opportunity to procure the same; and that relief in the movement of the commodities most essential at that time, namely, foodstuffs, perishable products, live stock, coal, and newsprint paper, could only be afforded by the current daily use and movement in the most effective manner of the existing equipment. It would require many months to provide the needed additions to equipment and a much larger outlay than the carriers were then able to provide. An enormous volume of traffic of all kinds awaited transportation. A considerable portion of the agricultural products of the year 1919 remained to be moved, and the new crop of the present year would be offered for shipment soon. There was country-wide need for the movement of coal for current purposes and for the coming winter, especially to the upper lake ports before the close of navigation. There was, and had been for some time past, a general shortage of competent railroad labor, lately made more pronounced by the suspension of work by large bodies of certain classes, which added to the difficulty of maintaining maximum operation of the railroads and contributed to the growing public distress on account of the delay in the movement of necessary products and raw materials for the commerce of the country.

The petition set forth that these conditions promised to continue for some period of time, and in the public interest the carriers called upon us to exercise the emergency powers granted to us by the transportation act, 1920, with respect to (*a*) the giving of priority and preference in movement of necessary food, fuel, and other vital commodities; (*b*) the relocation of empty equipment; (*c*) the necessary postponement and delay of loading or movement of other less important commodities; and (*d*) the reduction of existing passenger service as far as might be necessary; in order (*e*) that to the extent necessary to accomplish these purposes the carriers might be relieved from the operation of federal and state laws and orders recognized under ordinary transportation conditions.

Acting upon that petition and upon information as to the situation already in our possession, we determined that an emergency existed of so exigent a nature that these powers ought to be exercised immediately and without the holding of any hearing at the time.

Service Orders Nos. 1, 2 and 3

Service orders Nos. 1, 2, and 3 were entered May 20, 1920, and from time to time other service orders have been entered. As occasion showed the necessity, these orders have been continued, amended, modified, suspended, or superseded. The foundation of each of these orders has been the finding that, because of shortage of equipment and congestion of traffic, an emergency has existed which required immediate action and order. These service orders being of an emergency character have generally been made to run until our further order. In making the orders we have felt it incumbent upon us to act promptly. We have kept informed currently as to service conditions so that with improved conditions we could with equal promptness modify or suspend the action taken by us.

Service order No. 1 required that until our further order or direction all common carriers by railroad should forward traffic to destination by the routes most available to expedite its movement and relieve congestion, without regard to the routing thereof made by shippers or by carriers from which the traffic was received, or to the ownership of the cars; and car service rules, regulations, and practices were suspended and superseded in so far as conflicting with such directions.

By service order No. 2 we required various western carriers to deliver within a period of 20 consecutive days, beginning May 25, 1920, about 30,000 open-top cars to their eastern connections. Service order No. 3 required eastern carriers to deliver approximately 20,000 serviceable box cars, preferably cars owned by western carriers, to their western connections within a period of 30 consecutive days, beginning May 25, 1920. The initial relocation of cars so accomplished has been continued, in varying degrees, by the directions of the car service division of the American Railroad Association; and compliance with the directions of that organization has been so general that it has not been necessary to issue further formal orders of this character.

Thus, the initial relocation of box cars to railroads in the central western, northwestern, and southwestern districts accomplished by our formal order covered 19,800 cars; following such relocation, and in continuance of the policy, 109,830 box cars were similarly relocated on the directions of the car service division, without formal orders from us.

In order to obtain full and accurate information as to transportation conditions throughout the country, our representatives were directed for a time to furnish daily reports concerning such conditions in the territory in which they were located. It was soon found that the services of local interests at important gateways and terminals would be helpful. Accordingly, we organized terminal committees at 30 railroad and traffic centers. Each of these committees was expected to do what could be done informally, by conference, advice, and negotiation, to keep its gateway open, and to advise us as to needs. Each committee acted in close contact with a committee consisting of operating officers of the railroads entering the terminal or gateway, and these committees played an important part in relieving the unprecedented congestion. As the congestion was relieved the importance of these committees decreased. Certain of them have been discontinued, others now maintain a skeleton organization, while a few in the more important terminals are still functioning actively. We now have in contemplation the establishment and maintenance of service agencies throughout the country at points where experience has shown that congestion and transportation disabilities are most likely to occur. Our plans call for the maintenance of a sufficient number of local terminal committees to insure the fullest possible co-operation between the railroad carriers, the shipping public and commercial organizations, local and state authorities, and ourselves.

The terminal committees and carriers have made considerable use of the rerouting privileges under service order No. 1; and this has brought about a marked reduction in terminal congestion. On February 27 the accumulations of freight were 103,237 cars. For April the daily average accumulations of freight were 208,698 cars, and immediately following the outbreak of the strike mounted to more than 287,000 cars. The daily average in July had been reduced to 101,612 cars, and by October 22 the accumulations were reduced to 39,807 cars, which approximates normal conditions.

Preference for Coal

The petition of the carriers suggested the setting up of a list of essential commodities entitled to priority in the use of transportation. Following the filing of that petition, requests and demands of most insistent character for priority orders, so called, were laid before us from every quarter and as to substantially every important commodity. It appeared to us that the attempt to classify commodities generally, and to assign relative priorities to them for either the supply or movement of cars, would create an unnecessary confusion and disturbance of industry, and would add to the existing congestion and decrease the aggregate amount of tonnage which could be moved. But we were impressed with the imperative need of special consideration for the movement of coal.

The year 1920 began with no substantial coal stocks, and the demand for bituminous coal could be met only by large production. Moreover, coal production this year has been considerably retarded by strikes and by the wide dispersion of coal-carrying equipment. Not only was there an urgent call for unusually large amounts of coal on the part of the railroads, public utilities, and industries generally, but it soon became apparent that unless we took special measures to insure the movement of coal to certain sections the coal which must go into those sections would be forced through unusual routes, with loss of efficiency of equipment and further congestion of already clogged gateways. We felt it to be our duty to avoid such effects by adopting appropriate means within our emergency powers to insure a prompt, steady, and economical use of transportation facilities in the movement of coal.

On April 15, 1920, prior to the receipt of the petition of the railroad executives, we found it necessary to enter an order authorizing the railroads to restore the assigned car rules which had been approved by us. The assigned car is designed to enable the railroads to secure a regular and adequate supply of coal. Our order has since been sustained by the circuit court of appeals for the fourth circuit in *Lambert Run Coal Co.* v. *B. & O.*, not yet reported, and by the district court for the northern district of Alabama, southern division, in *Corona Coal Co.* v. *Southern R. R.*, 266 Fed., 726.

Service order No. 7 was issued June 19, 1920, and has been amended by service order No. 9, and succeeded by service order No. 20. The original order was designed to be kept in effect for 30 days, but was continued from time to time by supplemental order.

The effect of these orders was to require coal-loading carriers to use coal cars primarily for the transportation of that commodity and to require roads not loading coal to deliver such cars to their coal-loading connections, to the extent of the ability of such connecting lines to receive and absorb that class of equipment. The railroads were also required to place an embargo upon consignees who detained coal cars unreasonably. The cars designated as coal cars were permitted to move under load in the direction of the mines, on the return trip, upon routes not materially out of line.

Originally these restrictions applied only to carriers east of the Mississippi river. Effective October 15, 1920, the restrictions were extended to cover the territory east of the states of Montana, Wyoming, Colorado, and New Mexico. By amendment effective at midnight, November 16, the territory west of the Mississippi river was taken out from under the restrictions and all flat-bottom gondola cars were released.

The demand for the class of equipment described in the orders as "coal cars" was very great, due to the large road building and construction programs under way. Every effort has been made to mitigate the inevitable hardship. From time to time, as the emergency seemed to warrant, by amendments to the definition of "coal cars," various types of flat-bottom gondola cars have been released; and permits have been issued authorizing the use of specified numbers of such cars for commodities other than coal when the public interest seemed to require such action. It has been constantly recognized that priority for one class of traffic necessarily means deferring other traffic, and that real hardship must follow the preference given coal. But fuel is a first essential to the life of the individual as well as of industry, and without an adequate supply of fuel there would be no transportation of either raw materials or finished products and no operation of industries. Under the stress which is now relaxing it was impossible to transport all that was offered, and the designation of that which should be moved first was necessarily based upon considerations of sound public policy.

From the outset it was apparent that the situation as to bituminous coal for sections ordinarily served by means of the Great Lakes required special consideration. The quantity of bituminous coal needed by these sections to be moved via the lakes is approximately 25,000,000 tons annually. To effect movement of the supply for this territory in large part by all-rail routes would produce deplorable results. It would involve a longer rail haul, a greater detention of each car, and add to the congestion in gateways which are usually overcrowded and which were only beginning to recover from the partial paralysis brought on by the April strike. The detriment would have been to traffic generally and not merely to the movement of coal to the northwest.

To facilitate movement to the lower lake ports for transshipment we suggested and urged the formation of a pool or pools of coal at the ports, such as had been created and maintained during the war, for the purpose of promptly receiving and transshipping lake cargo and bunkerage coal. Considerable opposition was encountered at first, but this was overcome and the pool was formed.

By service order No. 5, entered June 9, 1920, we prescribed that railroad carriers serving Lake Erie ports should, in the transportation of bituminous coal consigned to such ports, give preference to carload shipments consigned to the manager of the Ore & Coal Exchange for transshipment by water as a part of a pool of lake cargo or bunkerage coal.

We also provided for an embargo to be laid upon the movement of bituminous coal to such ports for transshipment by water except upon a permit or direction which should be issued upon a showing of the ability of the consignee to unload without delay to the rail equipment and without impeding the preference and priority in the transportation of coal for the pool.

Thereafter, when it appeared that service order No. 5 was not having the effect of sufficiently increasing the movement of coal to the Lake Erie ports, conferences were had between the operators, the carriers, and prospective purchasers of coal destined to the northwest, and a completed program was laid before us whereby, from a specific district, coal should move in a given volume, aggregating for all the districts affected 4,000 cars a day, to the Lake Erie ports for transshipment by water. Service order No. 10, entered July 20, 1920, gave effect to the program. The primary preference in transportation from the mines in the district affected was given to the lake movement; after any shipper had on any given day shipped his proportion of cars for the lakes, he might ship the remainder of the cars to which he was entitled to any destination.

With various modifications, increasing or diminishing the territory and carriers affected thereby, this service order remained in effect until October 27, 1920, and was then indefinitely suspended by us, as it appeared that the emergency had been sufficiently relieved.

A somewhat similar situation existed as to coal needed by New England, which normally requires about 25,000,000 tons of bituminous coal annually. Not more than 10,000,000 tons of such coal can be moved efficiently by all-rail routes each year, and the remainder customarily must be moved by rail to tidewater, and thence by coastwise vessel or barge to New England. The gateways through which coal must pass in the movement all-rail to New England and the New England rail lines and terminals are continually overtaxed; and when they are clogged by an unusual volume of traffic the resulting placement of embargoes and detention of cars made empty seriously impede the general movement of traffic. The movement of coal to New England by the tidewater route was considerably below normal during the first five months of the present calendar year. To meet the situation and induce the movement of coal by the usual route, on June 19, 1920, we entered service order No. 6, whereby in effect preference was given to coal transported by rail to tidewater piers at and north of Charleston, S. C., when consigned to James J. Storrow if for New England or to anyone as a part of a pool for shipment to any other United States coastwise destination, over coal consigned to such ports for water transshipment in any other manner. Mr. Storrow had been designated to us by the governors of the New England states as the agent in whom they desired to have these functions vested.

This order not being availed of, on July 26, 1920, service order No. 11 was entered. Service order No. 11 was generally similar to service order No. 10 which had been issued with respect to the movement of coal to the Great Lakes. It proved efficacious, and, the emergency which caused the issuance of the order having been measurably relieved, with the consent of the New England interests was suspended, effective September 17, 1920.

Public Utilities

The effect of the shortage of equipment and congestion of traffic was felt severely by public utilities in the territory east of the Mississippi river. The demand was such that some mine operators having large contracts with such utilities at comparatively low prices delivered the coal they produced to other buyers at the higher market prices, and other mine operators found themselves in fact unable to complete their contracts. A critical condition resulted. In Michigan a number of public utilities were closed down for several days, and in many cities utilities and public institutions were down to the point where but a few hours' supply of fuel was on hand. It was imperative in the public interest that public utilities and public institutions be given such preference in car supply as was necessary to enable them to secure coal for current needs, so that they might continue to serve the public. By service orders No. 9, entered July 13, 1920, and No. 16, which superseded it, effective September 19, 1920, we authorized the railroads to give a sufficient supply of cars for the current use of public utilities and public institutions under certain conditions intended to safeguard against abuse. As a result these utilities and institutions have been kept going and generally have been able to accumulate some stocks of coal. This result having been reached, and in order to avoid the inequalities in distribution of cars at the mines which necessarily result from a priority order, service order No. 21 was entered, effective October 15, 1920, suspending the existing priorities.

Wagon Mines

A factor detrimentally affecting the coal-car supply has been the great increase during recent years in the number of coal mines, while there has been no similar increase in the equipment available for mine distribution. There are now approximately 3,000 more coal mines in operation than prior to the war. The total number of coal mines is estimated to be 10,634. Of these, 5,888, or 55 per cent, produce less than 10,000 tons of soft coal apiece per year, and an aggregate yield of 10,449,000 tons, which is less than 2 per cent of the entire production. Many of the so-called country bank or wagon mines are not equipped with tipples or arrangements for the dumping of coal into cars. Many are not equipped with private sidings. More than 98 per cent of the needed bituminous coal must be produced by established tipple mines, which number about 4,746. To the extent that the limited and fixed number of cars are distributed among 5,888 mines, which produce less than 2 per cent of the total, the general utility and efficiency of car service is decreased.

In an attempt to overcome the adverse effect of such dispersion of equipment we issued our service order No. 14 of August 25, 1920, prescribing that upon any day when a common carrier by railroad was unable to supply any mine upon its line with the required open-top cars it should not furnish or supply open-top cars to wagon mines not equipped to load such cars upon private tracks from a tipple, or other arrangement which permitted the coal to be dumped from an elevation into the car, until all other mines were fully supplied with open-top cars. We also required the carriers to count open-top cars furnished and supplied to wagon mines so equipped against such wagon mines under the same uniform mine ratings and car distribution rules as were applied to established mines.

By our service order No. 17, entered September 16, 1920, effective September 19, 1920, we required common carriers to establish and observe a rule that upon any day when a common carrier by railroad is unable to supply any mine upon its line with the required open-top cars, open-top cars shall not be furnished or supplied by it to any other mine which customarily does not load or is unable to load such open-top cars with coal within 24 hours from and after the time of placement for loading by the carrier, until all

other mines have been fully supplied with open-top cars.

Although the railroads serving authracite mines have furnished them continuously with nearly 100 per cent of the cars ordered, anl altnough the anthracite production up to October 16 exceeds that of the same period last year, the production this year has been retarded by the recent coal miners' strike in Pennsylvania and by the April strike in the yards. The recent anthracite strike retarded production to the extent of about 2,000,000 tons. There has been shortage of anthracite coal in some of the New England states, due largely to embargoes maintained by certain New England railroads during a substantial part of the time between April 1 and August 24. Those embargoes have now been modified, and it is hoped that the rail movement of anthracite coal to New England will proceed unhampered. During the period of rail embargoes anthracite coal could have moved to New England by rail and water. The existing rail-and-water rates to New England are higher than the all-rail rates, a fact which has perhaps acted as a deterrent in the movement of coal rail-and-water to New England. We have no jurisdiction over the water rates. Prior to the war the rail-and-water rates to New England were, generally speaking, substantially lower than the all-rail rates. Since the war they have been higher.

The demand for coal for exportation to European countries has been unusually great, and the bidding of foreign buyers against each other and against American consumers has doubtless had a marked effect in increasing the demand for coal in this country and to an even greater extent the price of free coal.

Repeated and insistent demands have been made upon us that we prohibit the exportation of coal, especially to European countries. Nothing has been found in the law which authorizes such action upon our part.

The foregoing is a review of the formal steps taken for the relief of the emergency. It was upon us and had to be met. We met it by such means as were available or could be improvised from day to day.

But to the extent that emergency in the fuel situation can be traced to the failure of dealers or consumers in regions remote from their sources of supply to purchase or make firm contracts for that supply in season, it is to be hoped that timely and effective action will be taken to prevent recurrence. They can hardly expect that our regulatory powers, which have to do with transportation rather than with distribution of commodities, should be relied upon to relieve them from the consequences of their own inertia, to the inconvenience or detriment of other regions and derangement of the orderly movement of general traffic.

Operating Efficiency

In addition to the activities above outlined, continuous efforts have been made to bring about improvement in operating efficiency. In this respect there has been close co-operation between the bureau of service and the car service division of the American Railroad Association, with the carriers, and with numerous organizations of shippers throughout the country. Statistics bearing on efficiency of operation have been analyzed day by day and the attention of the operating executives of the railroad carriers has been called with good results to many situations warranting attention. A special effort has been made to conserve and increase the efficiency of cars by increasing the average carload, by reducing the amount of equipment held for repairs, and by increasing the average daily mileage of each car. Much progress has been made in these respects.

Comparing August, 1920, with July, 1920, the increased mileage had the effect of releasing 118,645 cars. Comparing August, 1920, with June, 1920, there were released 219,036; with May, 1920, 292,048; with April, 1920, 730,118.

Comparing August, 1920, with August, 1919, the increased mileage had the effect of increasing the car supply 287,694 cars; with July, 1919, 296,891; with June, 1919, 395,855; with May, 1919, 413,848; with April, 1919, 575,788.

The comparisons with various months in 1920 are based on 2,500,654 cars, the average number of cars on line daily during the months of April, May, June, July, and August, 1920.

The comparisons with operations in 1919 are based upon 2,465.091 cars, the average number of cars on line daily during the months of April, May, June, July, and August, 1919.

The consequent improvement in the general operating situation is clearly evident, and the figures for September so far available show further progress in car mileage with resultant improvement in the general car supply.

The improvement in the general situation has been materially aided by the steady decrease in the number of cars under load with railroad material.

During the early part of the summer the railway executives established as their ideal for achievement in number of tons per loaded car an average of 30 tons.

The increased tonnage per car during August, 1920, as compared with July, 1920, had the effect of releasing approximately 11.346 cars; with June, 1920, 47,179 cars; with May, 1920, 89,695 cars.

Comparing August, 1920, with August, 1919, the increased tonnage per car had the effect of increasing the car supply approximately 104,942 cars; with July, 1919, 112,904 cars; with June, 1919, 130,003 cars; with May, 1919, 116,687 cars.

The increased and steadily increasing operating efficiency, as previously indicated, has made possible an increase in the number of loaded freight cars handled as follows:

Total revenue freight loaded:	Cars.
Jan. 1 to Oct. 16, 1920	34,083,610
Jan. 1 to Oct. 16, 1919	31,992,189
Cars increased compared with 1919	2,091,421
Four weeks ended—	
Oct. 23, 1918	3,778,862
Oct. 23, 1919	3,888,896
Sept. 25, 1920	3,798,416
Oct. 23, 1920	4,002,357
Increase compared with—	
September, 1920	203,941
October, 1919	113,461
October, 1918	223,495

Bureau of Finance

Sixteen applications for extensions of existing lines or construction of new lines of railroad have been filed; of these, two have been withdrawn, hearings have been had in respect of six, and eight remain to be heard. Nine applications for abandonment of existing lines have been filed; of these, one has been withdrawn, hearings have been held in respect of three, and five remain to be heard.

Acquisition of Control by One Carrier of Another Carrier—Consolidation of Carriers.

Paragraph (2) of section 5 of the interstate commerce act provides for the authorization by us of the acquisition of control by one carrier of another carrier, both engaged in transportation of passengers or property subject to the act, under such conditions as may be found just and reasonable and which do not involve the consolidation of such carriers into a single system for ownership and operation.

Two applications have been received, both of which have been granted in whole or in part. A form of questionnaire required of applicants is in course of preparation.

Paragraph (6) of section 5 of the interstate commerce act provides for the consolidation, in harmony with and in furtherance of a complete plan of consolidation to be approved by us, of two or more carriers by railroad into one corporation for ownership, management, and operation. Such carriers and any corporation organized to effect such consolidation are relieved from the operation of the antitrust laws and of all other restraints or pronibitions by law, state or federal, in so far as may be necessary to enable them to do anything authorized or required by any order made by us under and pursuant to the provisions of section (5) of the interstate commerce act. Such a general plan of consolidation is in preparation.

There have not been as yet any authorizations under paragraph (6) of section 5 of the interstate commerce act.

Issuance of Securities—Assumption of Obligations

Section 20a of the interstate commerce act provides for the authorization by us of the issue by carriers by railroad, subject to the act, of securities or the assumption by such carriers of any obligations or liabilities in respect of the securities of others.

Sixty-one applications have been received, 28 have been granted, 1 has been withdrawn, and 32 are pending.

Reimbursement of Deficits During Federal Control

Section 204 of the transportation act, 1920, as amended, provides for reimbursements of deficits in railway operating income of carriers not under federal control but which connected with or competed with carriers which were under control of the director general of railroads.

Carriers subject to the provisions of this section were required to submit statements of account in prescribed form, affording evidence which, taken together with statistical reports already on file with us, enabled the approximate determination of amounts due. Statements have been filed by 229 carriers, upon which payments aggregating $1,171,928 have been certified to 24 carriers under an arrangement for partial payments pending a final audit of the carriers' accounts.

Such certifications have been discontinued owing to a ruling of the comptroller of the treasury to the effect that partial payments under this section may no longer be made.

Guaranty of Income After Termination of Federal Control

Section 209 of the transportation act, 1920, provided in respect of practically all carriers for the guaranty for the six months succeeding the federal control period of a railway operating income measured by one-half the average income for the three-year period ended June 30, 1917. This guaranty, however, was extended only to such carriers as accepted the provisions of the section on or before March 15, 1920, and by such acceptance bound themselves to pay over to the gov-

ernment any excess in railway operating income above the guaranteed amount. Acceptances were filed within the prescribed time by 666 carriers.

During the guaranty period 243 applications for advances were filed by 148 carriers, upon which advances aggregating approximately $254,000,000 were certified for payment. According to the sworn monthly reports of Class I carriers, the amount payable by the United States to make good the guaranty is approximately $600,000,000, or $346,000,000 in excess of the amount already certified. It must be understood, however, that no exact estimate of the amount payable can be given at this time for the reason that many adjustments will necessarily be made in the reports as rendered. Under the transportation act, 1920, we are required to fix the amount of maintenance that may be allowed for each carrier in computing income for the guaranty period and it may be found that in many cases more has been charged for maintenance than can be allowed under the law. Other adjustments will be necessary.

The Treasury Department will honor our certificates issued for advances under subdivision (h) of section 209 of the transportation act, 1920, as amended, to meet fixed charges and operating expenses, and based upon estimated amounts necessary to make good the guaranty where carriers applied for such advances during the guaranty period even though the certificates are issued after the close of the period, but the comptroller of the treasury has ruled that payments may not be made upon our certificates issued under subdivision (g) of the section for amounts definitely ascertained to be due carriers to make good the guaranty unless such certificates are final and that only one final certificate may be issued to any carrier under this subdivision.

Many of the carriers to which amounts are due under this section made no application for an advance during the guaranty period; claims affecting railway operating income upon which the guaranty is based may be filed at any time within two years after the close of the period; the adjustments, restatement, and eliminations of accounts which we are required by law to effect in determining the amounts of the guaranty may require many months, and in the meantime, although we are able to certify that specified amounts are without question necessary to make good the guaranty in the case of each carrier, the carriers which did not apply for advances during the guaranty period can not now, under the ruling of the comptroller of the treasury, obtain these amounts undoubtedly due them without foreclosing them and us against the assertion and certification of other amounts which may hereafter be found to be unquestionably due under the terms of the statute.

The immediate payment to some of these carriers of the amounts or parts of the amounts which we can now determine to be certainly due them under the guaranty provisions of the transportation act, 1920, is vital to their meeting operating expenses, fixed charges, and other obligations which they must meet in order properly to serve the public as common carriers, and it is desirable that in case of deferred overcharge and loss and damage claims and other items which affect operating income and the final effect of which can not be definitely determined at this time, we be authorized to make a reasonable estimate of the net effect of such items and, when agreed to by the carrier, to use it in certifying the amount as final settlement of the guaranty.

It is therefore recommended that the Congress clearly provide:

(1) So as to permit and require the certification and payment under section 204 of the transportation act, 1920, of partial amounts ascertained in the case of each carrier to be due such carrier under that section;

(2) So as to permit and require the certification and payment under subdivision (g) of section 209 of the transportation act, 1920, of partial amounts ascertained in the case of each carrier as necessary to make good the guaranty to it; and

(3) So as to permit us in the case of deferred debits and credits to railway operating income which can not presently be definitely determined to make a reasonable estimate of the net effect of such items and, when agreed to by the carrier, to use it in certifying the amount as final settlement of the guaranty under this section.

Loans to Carriers During Transition Period

Section 210 of the transportation act, 1920, as amended, creates a revolving fund of $300,000,000 for the purpose among others of loans during the transition period immediately following the termination of federal control to carriers by railroad subject to the act, to meet maturing indebtedness or to acquire equipment or to make other additions and betterments, and provides that loans for equipment may be made to or through such organization, car trust, or other agency as may be determined upon or approved or organized for the purpose by us as most appropriate in the public interest for the construction and sale or lease of equipment to carriers.

The Association of Railway Executives and the American Short Line Railroad Association indicated to us that their associations would submit recommendations in respect of the loans to be made to the several carriers members of their respective associations out of the apportionment for each general purpose, in accordance with our rules of apportionment. The loan committee of the Association of Railway Executives met on June 25, July 15, and July 22, 1920, and made final report of recommendations as of July 28, 1920. The loan committee of the American Short Line Association is making individual recommendations for the carriers which are members of that association.

Pursuant to our announcement of June 7, 1920, that the allotment of $75,000,000 from the revolving fund for freight cars would be apportioned in such manner as to result in the acquisition of the largest number of such cars, efforts have been made looking to the formation of equipment corporations to supply the carriers with needed equipment. The principal developments in this direction have been, with respect to the trunk-line carriers, through the National Railway Service Corporation under the auspices of the National Association of Owners of Railroad Securities, and, with respect to the short-line carriers, through the Consolidated Railway Equipment Corporation under the auspices of the American Short-Line Railroad Association.

One hundred and forty formal applications for loans have been filed, of which 36 have been approved either in whole or in part. Thirty-one have been withdrawn, and two have have been denied.

Loans are being certified as rapidly as the carriers complete their applications and enable us from the record to make the findings required by the statute, namely, that the loan is necessary to enable the applicant properly to meet the transportation needs of the public, that the prospective earning power of the applicant and the character and value of the security offered are such as to furnish reasonable assurance of the applicant's ability to repay the loan within the time fixed therefor, and to meet its other obligations in connection with the loan, and reasonable protection to the United States, and that the applicant is unable to secure the necessary funds from other sources.

The following loans have been approved:

Ann Arbor	$285,000
Aransas Harbor Terminal	135,000
Atchison, Topeka & Santa Fe	5,493,600
Atlanta, Birmingham & Atlantic	200,000
Baltimore & Ohio	3,000,000
Bangor & Aroostook	200,000
Boston & Maine	5,000,000
Carolina, Clinchfield & Ohio	3,000,000
Central New England	300,000
Central of Georgia	815,000
Chesapeake & Ohio	3,759,000
Chicago & Western Indiana	8,000,000
Chicago, Burlington & Quincy	4,446,525
Chicago Great Western	276,000
Chicago, Indianapolis & Louisville	200,000
Chicago, Rock Island & Pacific	2,000,000
Delaware & Hudson	1,125,000
Erie	9,840,700
Great Northern	17,910,000
Hocking Valley	1,665,000
Illinois Central	4,440,000
Kansas City, Mexico & Orient	2,500,000
Long Island	719,000
Maine Central	1,653,000
Missouri Pacific	8,871,760
Northern Pacific	6,000,000
Pennsylvania	6,780,000
Salt Lake & Utah	300,000
Seaboard Air Line	6,073,400
Terminal Assn. of St. Louis	896,925
Texas & Pacific	3,000,000
Virginian	2,000,000
Western Maryland	2,422,800
Wheeling & Lake Erie	2,460,000
Total	$115,767,710

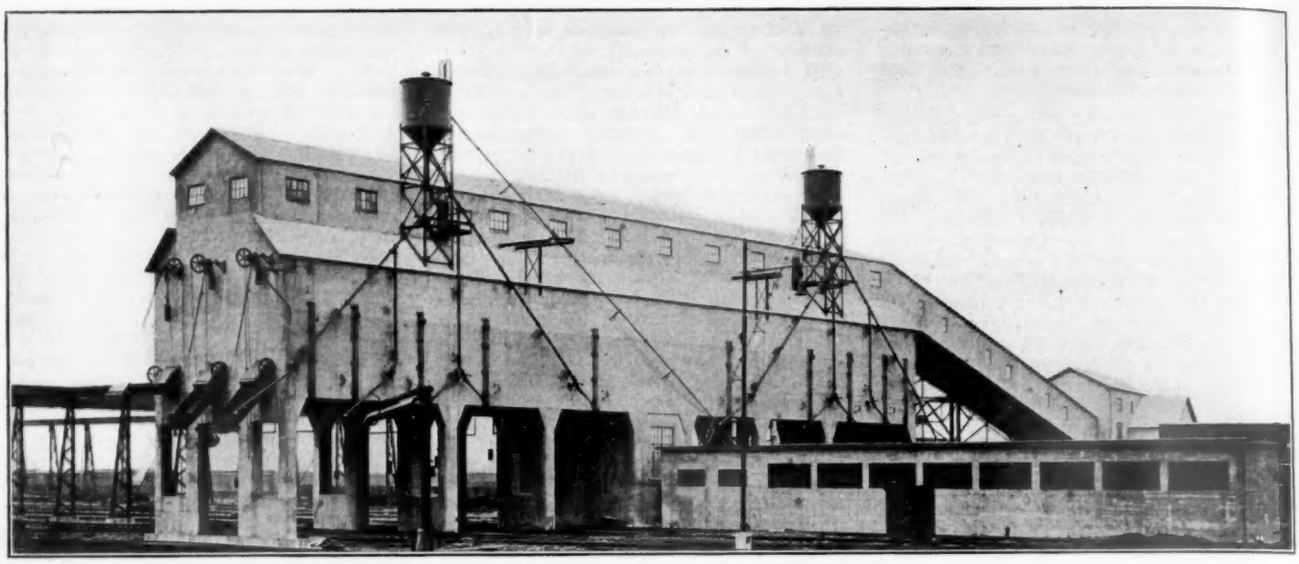
The purposes for which loans were approved are as follows:

To meet maturing indebtedness	$57,790,750
To aid in the acquisition of locomotives and cars	28,698,745
To aid in the making of other additions and betterments	29,278,215
Total	$115,767,710

Bureau of Accounts

While the accounting examinations required by the federal control act have confined the activities of the bureau along necessarily restricted lines and thus have had the effect of suspending our more extended examinations covering all phases of carriers' accounts, they have nevertheless accomplished much in the interest of uniform accounting and have resulted in a clearer understanding by carriers' accounting officers generally of the principles embodied in our accounting regulations. Similar benefits will accrue from the bureau's work in connection with sections 204 and 209 of the transportation act, 1920.

Section 20 of the interstate commerce act now requires us to prescribe as soon as practicable for carriers subject to the act the classes of property for which depreciation charges may properly be included under operating expenses and the percentages of depreciation which shall be charged with respect to each of such classes of property. For the purpose of carrying out these requirements a special section of the bureau has been created which will devote its entire time to the consideration of depreciation. That section is now engaged on preliminary work so that the necessary studies and analyses may be systematically and efficiently undertaken.



Coaling Station of 1,600 Tons Capacity Serving 10 Tracks with 3 Kinds of Coal

Modernizing Existing Locomotive Terminals*

Modern Facilities Make for Economy and Reduce Time Required to Prepare Locomotives for Service

By G. W. Rink
Asst. Supt. Motive Power, Central Railroad of New Jersey

LOCOMOTIVE TERMINALS play an important part in the operation of the railroad, as the transportation department is at all times entirely dependent upon them for its supply of serviceable power for the movement of both passenger and freight cars. Should the capacity of the terminal or the facilities for making repairs be inadequate, the result will soon reflect itself in more time being required to prepare engines for service and more frequent detention on the road due to failures.

The general layout of engine terminals, also the extent of shop facilities provided, depends entirely on their location with reference to the general locomotive repair shop. When located in close proximity it is necessary to provide only such facilities as may be necessary to make the general run of roundhouse repairs, depending upon the main shop for the manufacture and supply of a large percentage of materials required for use at the terminal. But when engine terminals are located some distance from the general locomotive repair shops, they should be provided with enlarged facilities so as to perform all the necessary machine, blacksmith, and boiler-shop operations required when making more extensive repairs, and be entirely independent of the main shop. It is important, however, to eliminate at the terminals the manufacture of such standard parts as may be produced elsewhere at less cost. At outlying points where only light repairs are made to maintain locomotives in serviceable condition, such facilities as described above are not necessary.

At all important terminals the measure of efficient operation is the time required to prepare locomotives for service and the mileage which can be obtained between shoppings for class repairs. Any saving in time of course permits more intensive use of locomotives when transportation requirements make it necessary, but this saving can only be accomplished by providing a first-class terminal layout with proper equipment so as to enable the terminal organization to handle all engines with promptness and despatch. This requires a properly balanced organization to perform the various classes of work required, and coupled with modern labor- and time-saving facilities, should tend to reduce congestion materially and maintain the equipment properly.

Repairs at Locomotive Terminals

The location of the engine terminal with reference to the general locomotive repair shop will have some bearing on the necessity of performing relatively heavy repairs at the terminal. Where they are within reasonable distance of each other, it may be desirable to have a considerable part of the heavy repair work transferred to the main shop, where the repairs can be performed more expeditiously and the engine returned to service. On the other hand, this class of work has a tendency to interfere with the output of the locomotive repair shop, and especially so if it is found difficult to maintain the necessary quota of class repairs, considering the equipment as a whole. In such cases it would appear more desirable to increase the engine-terminal forces and provide sufficient facilities to at least make Class 5 repairs and the general run of heavy running repairs, including the removal and reapplication of a part or complete set of flues.

Where it is found desirable to perform such heavy repair work, it should preferably be done in a small building located adjacent to the machine shop, and provided with several tracks for holding engines and an overhead crane or power-driven locomotive screw hoist to facilitate the removal of all wheels.

This feature is very desirable, especially if heavy locomotives are to be handled. It also increases the track capacity within

*From a paper presented at the annual meeting of The American Society of Mechanical Engineers, December 8, 1920.

the roundhouse to that extent and repairs can be made more promptly and economically.

With reference to existing terminals, a careful study of the property will no doubt disclose the fact that improvements can be made whereby greater efficiency may be obtained. Modern facilities should be installed wherever it is possible to produce a saving in time and labor.

Coal, Sand and Ash Handling Facilities

The type of coaling stations selected must depend on the number of engines handled, the number of tracks which may be available for coaling engines and the kind of coal to be handled. Some roads in the East use bituminous, broken anthracite, and buckwheat. Where the quantity of coal handled is small, the locomotives can be coaled from an elevated platform using one-ton buckets or by means of a locomotive crane direct from car. When it is necessary to deliver coal to two or more tracks, a mechanical type of coal-handling apparatus is generally installed. Marked improvements have been made in receiving, hoisting and distributing equipment, which has resulted in smaller operating forces being required. Measuring devices are also installed for recording the amount of coal delivered to tenders. An electric winch should be provided at large terminals at the loaded coal-car track so that cars can be hauled to position over track hopper.

The sandhouse should be located at the coaling station. Sufficient wet-sand storage space should be provided as well as means for drying the sand by coal stove or steam. Compressed air should also be available so that the sand can be delivered to overhead storage bins, having suitable outlets to deliver the sand direct to engine by gravity. All important engine terminals should have a complete installation of this character.

During recent years the tendency when constructing large terminals has been to install pits filled with water. The cinders drop directly into the water and move toward the center of the pit, due to the outer wall sloping inwardly, and are removed either by a locomotive crane or by an overhead crane traversing the entire length of the cinder pit, the cinders being deposited by means of grab buckets directly into cars located on the loading track. The pit is filled with water to a depth of about five feet, water being admitted at one end of the pit and overflow provided at the opposite end. Provision is made to protect the floor of the pit against injury by the grab bucket, by imbedding old rails in the concrete. Due to the quantity of water required for large installations of this character, provision should be made if possible for a supply from a nearby stream or other natural source.

Steam-jet ash conveyors can be installed to advantage where ample supply of steam is available. The system consists of an 8-in. cast-iron pipe made exceedingly hard to withstand wear, with intakes provided at suitable intervals. The cinders are drawn by suction through the main pipe line and then propelled by means of the steam jet direct to car or storage bin, suitably located. Cinders handled in this manner are not wetted down until they enter storage bin, where a water spray is provided. This type of cinder conveyor has proved very satisfactory for handling cinders in power houses and should give good service when installed in connection with small engine terminals.

Inspection Pits

Inspection pits are now being installed at a number of large engine terminals. These are located on the inbound tracks with the view of making inspection of locomotives before they are placed over the cinder pit. Fires can then be withdrawn when the engines pass over the cinder pit, if inspection develops defects which warrant this procedure, thus saving time and expense involved if engine was inspected within the roundhouse after passing over cinder pit. There are many advantages in having inspection made at this time as the foreman by means of pneumatic tubes can be furnished with both the engineer's and inspector's reports showing work to be done before engines are placed in the shop.

These inspection pits are generally made about 100 ft. long, two in number, and covered with a protection shed. Special arrangements are provided to permit inspectors to enter the pits. Proper drainage and lighting facilities are also provided. In lieu of reporting on inspectors' reports such work as loose nuts, missing cotters, etc., it would be desirable to station at these inspection sheds mechanics who can perform this work at once, thus saving time in locating these defects in the shop after being reported.

Heating and Ventilation

Heating and ventilation is of first importance in a modern and efficient roundhouse. With the possible exception of small isolated houses in mild climates a properly designed system combining heating and ventilation should be adopted. An installation of this kind consists of a blower drawing air through hot-blast heaters located in a fan room which forms a projection on the outer wall of the roundhouse. The heated air is discharged through an underground concrete duct system.

A combined heating and ventilating system should supply sufficient air for the quick removal of smoke, gas and vapors. Ventilating sash, louvers and other openings should be provided at the high points of the room to supplement the forced system by directing the flow of air currents and facilitating the removal of hot gases. This feature should be carefully considered, for in roundhouse ventilation it is not so much a question of diluting the air as it is of establishing a positive flow of air which will carry the gases along with it.

It is sometimes necessary, due to the requirements of local ordinances or because the type of house prevents the use of smoke jacks above the locomotive stacks, to install an exhaust system so as to remove gases directly from the locomotive smokestacks. In the latter case connections are made to the smokestacks by means of swinging hoods. This system is not necessary from a ventilating standpoint, and should only be installed where conditions compel its use.

With the usual type of indirect system the fan rooms, one or two in number depending on the size of the house, should be located midway of the length of the house to be served, thereby reducing the temperature drop of the air in the duct as well as the friction head against which the fan must work. The quantity of air supplied together with the number, size and location of air outlets depends largely on the type, size, and location of the roundhouse. The amount of heat to be supplied with the air is also a variable factor and should have careful study so as to provide a comfortable working temperature under the conditions obtaining in roundhouse operation.

The question as to whether the fan should be motor- or engine-driven depends on the quantity of exhaust steam available for heating and whether or not it is desired to operate the fan for ventilation in the summer time. The hot-blast heaters should be operated through a two-pipe vacuum system, particularly where exhaust steam is available, so as to reduce the back pressure and provide a positive circulation of steam through all parts of the heaters. The temperature of the air can be regulated to suit the variable outside temperature by subdividing the heater into units with a control valve on each. The fan should be operated at a constant speed so as to make the ventilation independent of the heating and to provide a uniform condition at all times.

Lighting

Adequate daylight facilities through large window areas together with light, cheerful surroundings are highly desirable. The windows should be spaced and located so that daylight

conditions are fairly uniform. They should also provide sufficient daylight so that artificial light will be required only during those portions of the day when it would naturally be considered necessary. Good natural and artificial light will reduce accidents, provide greater accuracy in workmanship and simplify the supervision of the men.

Much needed improvement is desired in connection with artificial lighting of engine terminals. In the roundhouse proper, lights mounted on the outer wall and reflected between engine pits have given satisfactory results when augmented by sufficient lights suspended from the ceiling to afford general illumination. Machine shops, etc., should be provided with a general or overhead lighting and also supplemented by individual lamps conveniently placed, preferably on brackets so that they may be adjusted.

For lighting the roundhouse circle, flood lights should be used whenever possible as general illumination will add considerably to the safe movement of locomotives to and from turntable and engine house. Ash pits can be illuminated by rows of reflector lights placed on poles, and similar provisions should be made at other points beyond turntable or by the use of flood lights on the tops of coaling stations. The introduction of many new types of lamps has made it possible to provide better illumination when changing from an old to a new lighting system. A study should be made of the conditions and proper lamps selected for the purpose.

Modern Ash Pit on the Central of New Jersey

Hot-Water Washout and Refilling System

Facilities should be provided for washing out boilers, using hot water under pressure and refilling with hot water after washing. There is an actual saving in time as compared to the old system of washing out and refilling with cold water; with this system boilers are washed out more thoroughly and strains within the boiler due to expansion and contraction are considerably reduced, with the result that the cost of boiler maintenance is reduced.

There are two types of installations for this purpose in general use, one of which utilizes the blow-off water for washout purposes only, while the other utilizes as much of the blow-off water as necessary for this purpose and the remainder, after being clarified, for refilling purposes. As blow-off water is always soft and becomes clarified soon after storage, it is of course the best water for the generation of steam and its reuse in this manner is responsible for the greater efficiency of the latter type of installations.

Hot-water washout and refilling systems can be economically installed in any size to meet the requirements in any engine terminal of moderate size. The usual practice is to deliver washout water at temperatures varying from 100 deg. to 140 deg. The refilling water generally has an average temperature of approximately 210 deg. Where such systems have been introduced, there is a material reduction in time required to do this work. Boilers have been blown off, refilled, fired, and steam pressure brought up to 100 lb. within from two to three hours. This does not include such time as may be required to make necessary repairs to boilers.

Wheel-Dropping Facilities

The usual wheel-dropping facilities consist of a drop-pit system which provides for depressed pits at right angles to shop track, using telescoping pneumatic or hydraulic jacks for lowering and raising wheels, separate pits and jacks being installed for handling driver and engine-truck wheels.

Screw-jack locomotive hoists especially designed for unwheeling locomotives are being more extensively used at engine terminals, and their use has made possible a large saving in both time and labor. These hoists operate with a high degree of safety as compared with the drop-pit system; furthermore they can be located within the roundhouse or installed in a separate building, in which case it would be desirable to also install the wheel lathe and other tools and appliances for taking care of heavy running repairs.

When screw-jack locomotive hoists are installed, it does not eliminate the necessity for providing drop pits in the roundhouse, which may be needed in order to prevent loss of time in making repairs to locomotives which may only require the dropping of a single pair of drivers or engine-truck wheels.

Machine, Boiler, and Smith Shops

Old and obsolete tools should be replaced by modern machine tools, which insure increased production at lower costs and the work being done more accurately and promptly and power maintained in better condition. Individual motor drive for the larger machines and group drive for the smaller machines is preferable. Facilities should include steam hammer, forges with down-draft hoods (number and size to suit work to be performed), punch and shear, plate-bending rolls, straightening plate, flange fire, etc.

Autogenous cutting and welding outfits are also considered indispensable and are used principally in making repairs to locomotive fireboxes, engine frames and in reclaiming miscellaneous parts which can readily be repaired by means of this process.

The Power House

Important engine terminals should be provided with a power plant of sufficient size to take care of the future as well as immediate needs of the terminal. In a number of cases this plant is required to provide steam for thawing snow at switches on main-line track leading to the terminal passenger station and supply heat and light to station buildings, and function in general as a service station. Labor-saving devices should be installed in the way of coal- and ash-handling machinery, automatic stokers and large-capacity overhead coal-storage bunkers. Consideration should be given to operating with condensers, requiring a cooling tower if fresh water is used, the surplus water being delivered to flood ash pit for locomotive cinders if this type is used. Tanks of ample capacity should be located at power house with water mains of proper size supplying water for shop use and filling of tenders at terminal tracks, locating water columns away from switches in cold climates to prevent freezing. At smaller terminals, discarded locomotive boilers are used to furnish steam for power and heat. A close study made of

these installations will reveal the fact that in many cases money can be saved by the use of modern water-tube boilers.

Discussion

The discussion of this paper was featured by the remarks of a representative of the operating department of the Pennsylvania Railroad, Mr. Wm. Elmer, division superintendent at Altoona. Mr. Elmer discussed the most important phases of the locomotive terminal situation with particular reference to its effect upon locomotive performance on one of the busiest railroad divisions of the United States. Confronted with the problem of getting the utmost service out of every available locomotive, Mr. Elmer has developed a unique system of records indicating the service performed by each locomotive on his division which he described at some length in the course of his discussion.

The paper on Modernizing Locomotive Terminals was also discussed by representatives of the Robinson and Austin Construction Companies who have recently been engaged in very extensive terminal development. Appropriate emphasis was laid on some of the most vital features in terminal construction and an attempt was made to demonstrate that the value of terminal improvements can be arrived at by capitalizing the enhanced earning power derived from locomotives handled in modern vs. obsolete terminals.

The discussion was closed by L. G. Plant, associate editor of the *Railway Age*, who stated that consideration of the locomotive terminal from any angle would be incomplete if it did not place sufficient weight on the outstanding function of the terminal, which is to expedite the movement of locomotives, and emphasized those features of terminal development which have the most direct bearing upon the time element involved in handling locomotives. It is predicted that the trend in locomotive terminal development, which is undoubtedly toward facilities for executing a greater proportion of heavy repairs, will eventually comprehend a development that will supersede many of the functions of the central erecting shop.

America's Foreign Competition

By Robert E. Thayer

European Editor of the *Railway Age*.

LONDON.

DURING THE PAST TWO YEARS American manufacturers interested in foreign business have not had to go far nor seek very hard for it. The war left the European countries, especially France, Belgium and Germany, in such a position that they were unable to produce sufficiently to meet their own respective requirements. The principal European manufacturing countries which participated more directly in the war have gradually readjusted themselves so that now they are able to handle export business, and from this time on American industry will find it hard to maintain its foreign business unless it is willing to make some sacrifices in order to retain the foothold it now has.

Take the locomotive building industry for example. As has been previously reported in these columns, both the United States and England have lost a number of locomotive orders for the Java State Railways to Germany, the prices of the Germans on account of the difference in the then money values being 40 per cent cheaper than the bids of the American and English competing companies, with the guaranteed deliveries the same. The situation today has been stated to be approximately as follows: Germany can beat American prices, under the present money values, anywhere from 15 to 21 or 22 per cent. Prices for main line locomotives delivered to vessels for export are about the same in England and the United States. England has somewhat the advantage on small contractors' locomotives. In the case of the main line locomotives, England has the advantage over America where the freight rates to the point of delivery are cheaper. Furthermore the German competition is constantly assuming more serious proportions. It has been reported on very good authority that the large locomotive builders, Henschel of Cassel, Germany, have obtained control of the Winterthur locomotive works in Switzerland, and in order to remove the "curse" of locomotives being supplied by Germany, orders are now being filled through the Winterthur works with material furnished from Germany.

It is not the locomotive industry alone that is feeling the effects of this resuscitation of European industry. American machine tool builders who have during the war and even before the war enjoyed a large business in Europe, are feeling the effects of this competition sadly.

The primary underlying factor in the entire export situation is of course the rate of exchange. A study of the published rates of exchange showing the value of the dollar in various European countries will indicate more clearly than anything else the seriousness of the situation. Contrary to all hopes a year ago, the exchange situation does not improve for the American exporters. Our government does not seem inclined to assist in bringing the exchange rate back to normal conditionus.

The situation requires some very serious consideration on the part of the American exporters if they are to continue in the export developments that they have already undertaken. If they are to retain the hold they have already obtained in foreign markets they must be prepared to sacrifice profits or even to sustain losses until conditions become more normal. It is a great pity that the foreign trade development work of the past few years should be allowed to distintegrate.

Congress in Session

WASHINGTON, D. C.

THE FINAL SHORT SESSION of the 66th Congress was opened on December 6, but very little activity affecting the railroads is expected during this session. Senator Cummins, chairman of the Senate committee on interstate commerce, has announced that he proposes to press at this session the proposed amendment to the valuation act to omit the requirement that the Interstate Commerce Commission shall report the cost of condemnation and damages of railroad land, but at an informal conference of leading members of the interstate commerce committee it was decided not to undertake any amendments to the transportation act at this session, until the act has been given a further trial, and Chairman Cummins is to leave this week for a month's rest in Florida. It is expected that numerous bills to amend the act in various particulars may be introduced by various individual members, but unless some unforeseen general demand for a change in the act appears, these will probably not get beyond the committees. An effort may be made to amend the provisions of the act relating to the six months' guaranty to provide specifically that partial payments of the guaranty may be made, because the comptroller of the treasury has ruled that such partial payments cannot be made under the act as it stands, but such an amendment would require very little discussion and is in line with what it is generally understood that Congress intended when the act was passed.

If the decisions of the Interstate Commerce Commission ordering increases in intrastate rates corresponding to those authorized for interstate traffic are sustained by the courts, it is certain that a vigorous effort will be made by the states' rights extremists to amend the provisions of the law under which the commission acted, and bills to that effect will prob-

ably be introduced before the Supreme Court has had an opportunity to pass on the case, but it is not expected that a real fight will be made until the court has rendered a decision.

The principal business of the short session of Congress will be the passing of appropriation bills. The book of estimates of appropriations for the fiscal year ended June 30, 1922, provides for $5,574,500 for the Interstate Commerce Commission, as compared with $4,693,100 for this year, including $2,000,000 for valuation, as against $1,750,000 for this year. The proposed appropriation for the Railroad Labor Board is $550,000, as against $450,000 for this year. An appropriation of $4,000,000 for the Alaska railroad is proposed.

In his message to Congress on December 7 the President said: "The relation between the current receipts and current expenditures of the government during the present fiscal year as well as during the last half of the last fiscal year has been disturbed by the extraordinary burdens thrown upon the Treasury by the transportation act, in connection with the return of the railroads to private control. Over $600,000,000 has already been paid to the railroads under this act—$350,000,000 during the present fiscal year—and it is estimated that further payments aggregating possibly $650,000,000 must still be made to the railroads during the current year. It is obvious that these large payments have already seriously limited the government's progress in retiring the floating debt."

Senator Cummins and Representative Esch introduced in the Senate and House, respectively, on December 7, bills to extend the effective date of Section 10 of the Clayton law from January 1, 1920, to January 1, 1922. The effective date of this section has been postponed several times before.

Senator Pittman of Nevada has introduced a bill to amend the long and short haul clause of the interstate commerce act to remove discretion from the Interstate Commerce Commission in granting relief from its provisions.

Car Loading Shows Further Decrease

WASHINGTON, D. C.

REVENUE FREIGHT CAR LOADING for the week ending November 27 was 82,000 cars less than for the week before, according to reports compiled by the Car Service Division of the American Railway Association. The total was 797,673, as compared with 739,197 in the corresponding week of 1919 and 735,628 in 1918. This was the largest decrease reported for any week this year since the loading figures began to fall, in the last week of October, but a large part of the decrease is attributed to the Thanksgiving Day holiday. While the total is still greater than for the corresponding weeks of the last two years, the fact that it was larger than for 1919 is due to the fact that coal loading last year was small on account of the miners' strike. The number of cars loaded with coal in the week of November 27 this year was 89,000 greater than for the corresponding week of 1919. The loading of all the other classes of commodities except coke and ore was smaller than for the corresponding week of 1919. The report is given below.

Freight car accumulations for the week ended November 26 had been reduced to 26,324 or 2,300 less than for the previous week. Of the total, 8,270 were held awaiting export or coastwise movement.

For the week ending November 30 the railroads reported a surplus of 49,695 cars and shortages amounting to only 19,673 cars. This represents an increase in the surplus in a week of 17,000 cars and a reduction in shortage of 11,000. Of the surplus 34,756 were box cars while a large part of the shortage consisted of 11,091 coal cars.

A new record for the year in the production and transportation of bituminous coal was made during the week ending on December 4; according to preliminary estimates compiled by the Car Service Division, production during the week was estimated at 12,675,000 tons. This is 1,259,000 tons or 11 per cent more than were produced the week before. During the week, it is estimated, 229,016 cars were loaded with bituminous coal, which would be an increase of 21,020 over the preceding week and 5,000 more than were loaded during any one week so far this year. The nearest approach to this total was reached during the week which ended on October 30 when the number loaded was 223,717 cars.

This was the first week in more than a month that the railroads have been called upon to furnish transportation facilities for a production of more than 12 million tons of bituminous coal. In October, production for four consecutive weeks went above that mark but during November observance of various holidays in the coal fields caused a decrease in production. Comparisons of the amounts produced on the various working days, however, show that had the mines put in full weeks, production last month would doubtlessly have continued to exceed the 12 million mark.

THE GRAND TRUNK has sent a message to its station staffs and track forces expressing appreciation of their efforts in caring for the flower beds and lawns around stations and tool houses during the past season.

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS

SUMMARY—ALL DISTRICTS; COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO, FOR WEEK ENDING SATURDAY, NOVEMBER 27, 1920

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded: This year, 1920	Corresponding year, 1919	Corresponding year, 1918	Received from connections: This year, 1920	Corresponding year, 1919	Corresponding year, 1918
Eastern	1920	5,496	3,296	51,508	2,539	5,060	6,288	40,824	67,006	182,017	.....	.....	230,182	.....	.....
	1919	6,022	3,425	27,678	3,881	7,002	2,907	30,430	96,964	.....	178,309	177,612	.....	226,201	227,108
Allegheny	1920	2,915	3,451	61,874	7,451	3,248	6,235	33,727	56,461	175,362	.....	.....	130,959	.....	.....
	1919	3,070	3,594	34,381	4,913	4,066	3,757	38,596	65,364	.....	157,741	171,068	.....	126,633	160,736
Pocahontas	1920	107	123	20,878	636	1,623	129	2,340	5,750	31,586	.....	.....	16,740	.....	.....
	1919	207	146	24,667	596	1,899	259	139	8,731	.....	36,644	32,508	.....	18,630	21,584
Southern	1920	2,566	1,882	31,227	1,358	15,818	2,583	32,977	33,247	121,658	.....	.....	67,157	.....	.....
	1919	2,533	2,092	11,023	253	15,752	2,052	16,568	52,510	.....	102,783	105,017	.....	71,828	68,010
Northwestern	1920	10,751	8,535	9,903	1,662	12,595	13,476	23,485	26,856	107,263	.....	.....	50,640	.....	.....
	1919	11,312	10,090	10,852	637	13,278	5,524	18,837	37,321	.....	107,851	104,005	.....	54,543	67,617
Central Western	1920	8,675	10,397	25,206	562	4,043	2,547	26,297	38,614	116,341	.....	.....	60,254	.....	.....
	1919	10,120	13,061	6,933	479	4,134	2,837	21,343	43,077	.....	101,984	99,325	.....	67,271	56,693
Southwestern	1920	3,412	2,160	5,389	130	7,767	187	14,308	30,093	63,446	.....	.....	49,014	.....	.....
	1919	4,185	2,787	1,451	130	5,999	200	12,744	26,389	.....	53,885	46,093	.....	46,767	39,731
Total all roads	1920	33,922	29,844	205,985	14,338	50,154	31,445	173,958	256,027	797,673	.....	.....	604,966	.....	.....
	1919	37,449	35,195	116,985	10,889	52,130	17,536	138,657	330,356	.....	739,197	.....	.....	611,793	.....
	1918	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	735,628	.....	.....	641,479
Increase compared	1919	.....	.....	89,000	3,449	.....	13,909	35,301	.....	58,476	.....	.....	.....	.....	.....
Decrease compared	1919	3,527	5,351	.....	.....	1,976	.....	.....	72,329	.....	.....	.....	6,827	.....	.....
Increase compared	1918	.....	.....	.....	.....	.....	.....	.....	.....	62,045	.....	.....	.....	.....	.....
Decrease compared	1918	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29,686	.....	.....

*L. C. L. merchandise loading figures for 1920 and 1919 are not comparable as some roads are not able to separate their L. C. L. freight and miscellaneous of 1919. Add merchandise and miscellaneous columns to get a fair comparison.

Heavy Slide Badly Deranges Train Operation

Pennsylvania Railroad Overcomes Impending Destruction of Main Line Tracks at Pittsburgh, Pa.

THE THREATENED CUTTING in two of the Pennsylvania's main line by the slide at Pittsburgh, Pa., has been at last safely averted and in a large measure its worst effects have been overcome. All of the tracks have been cleared of the material brought down by the slide, though all of them are not as yet being operated. There are two yard tracks yet to be placed in service. Starting with December 7, train service of the Monongahela division will be again handled in and

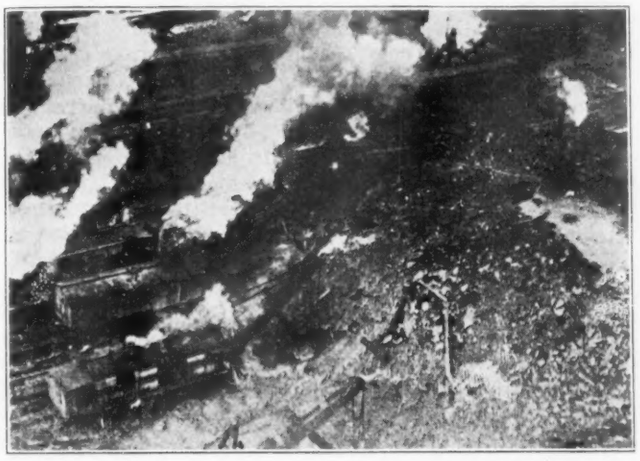


Photo by Underwood & Underwood.

Steam Shovels Working on the Flanks of the Slide

out of the Union station, and shortly after that it is expected that normal operations will be resumed.

The Pennsylvania, east from its Union station, follows closely the base of a large hill composed of slate, shale and clay, and at numerous places along its lines this hillside is retained by heavy masonry walls. The slide, however, which caused so much damage was not a movement of the natural hillside, but was the result of the failure of a retaining wall and the subsequent pouring out of a large mass of filled material occupying what is known as Jones' Hollow, about three-quarters of a mile east of the station. This hollow or gully originally extended back into the hillside for a considerable distance, and when Bigelow boulevard was constructed along the hillside the hollow was partially filled in and a better support obtained for the roadway which followed around the contour of the gully.

At that time a heavy retaining wall was built, and as the filling increased a rock-filled crib was added some distance up from the retaining wall to help maintain the fill and the wall. With the widening of the boulevard and from other causes various materials were dumped into the gully until the land had been built well out beyond the original boulevard. A city stable was subsequently built upon this, and plans made for eliminating the curvature of the boulevard at this point. Further filling was made until finally the great mass of water-soaked earth overflowed the ends of the retaining walls and shortly after broke down the entire structure.

The Destructive Action of the Slide

At the base the retaining wall was completely destroyed, and as parts fell and were forced out over the tracks of the Pennsylvania they carried away the west 230 ft. of a large 290-ft. inspection and supply building, demolishing that much of it completely. With the removal or breaking down of the retaining wall the only restraint was removed and the earth fill, rendered more or less plastic by numerous rains, moved rapidly out over the tracks to a depth of from 40 ft. to 50 ft. and covering a front of over 100 ft. in length.

As the wall had previously given indications that it might fail, the Pennsylvania had arranged for and kept a temporary organization of steam shovels in readiness. The movement was so fast, soon reaching a maximum of about one foot an hour, and the amount so large, that this force had to be greatly increased and in a short time the railroad had nine steam shovels and two ditchers working day and night by the aid of floodlights in an attempt to keep ahead or at least even with the progress of the slide.

In all, eight tracks, including the main line tracks, were completely buried, and as the material flowed out over them the tracks ahead of the slide and to the sides were upheaved as high as 15 ft. in some cases. In order to make any progress and at the same time to safeguard the shovels, they were arranged in a semi-circle around the edges of the small hill which had been created by the outflow of the materials. The disturbance of the roadbed, however, was so great that the tracks upon which the shovels operated were destroyed regularly, and at times it required considerable work to save the shovels themselves.

Train Operation Necessitates Rerouting

In addition to the eight tracks buried by the slide, three more of the nineteen tracks at this point were rendered unavailable for traffic by the necessity of having loading tracks,

Photo by Underwood & Underwood

A Typical View of the Advance of the Slide

etc., for the shovels. This left only eight tracks to handle the large amount of traffic which passes over the Pennsylvania in this vicinity. To make matters still more complex all telegraph and signal wiring, etc., had to be moved or replaced as the progress of the slide interfered with or destroyed parts of it. In order to facilitate the operation of traffic, all trains on the Monongahela division were rerouted to leave the Fourth avenue station, and all trains on the Conemaugh division were received and sent out from the Federal street station. The main line tracks from the east

and leading into the yard at this point of the slide were cut into the remaining eight passenger yard tracks and an independent organization built up to take care of this phase of the train operation. As it was feared that continued rains might accelerate the slide and thus cut the entire yard in two, plans were made for the prospective rerouting of all trains. These included the continued use of the Union station for all trains west and the use of the East Liberty station for all trains east, beginning and ending at Pittsburgh, while all through trains were to be diverted by way of the Brilliant cut-off and Port Perry branch.

On the city's side of the problem, the settling and moving out of the fill at the crest of the slide caused the failure of the boulevard for a distance of about 125 ft. A city stable located on the filled-in part of the gully was demolished, while a large warehouse located on the opposite side of the boulevard, but near the point of failure of the boulevard, was considerably undermined at one corner and settled appreciably. Large earth cracks developed even for some distance back of the boulevard. In order to take care of the vehicular traffic a two-way trestle was built across the settled portion of the boulevard and carried on piles driven to depths of from 40 ft. to 70 ft. As the movement of the slide increased the piles showed some corresponding movement, but to date have remained sufficiently firm and the trestle is still considered safe. The action of the slide, however, was so treacherous that it was thought that it might possibly continue, especially if heavy rains were to follow, to such an extent that it would cross the Pennsylvania's yard, break down the retaining wall on the far side, and cut Liberty avenue in two. This would then result in two of the main vehicular arteries of the city being inoperative.

The situation became so serious that General George W. Goethals was called in by the city for consultation. After studying the situation, he rendered a report on the slide which is given in abstract below:

General Goethals' Report on the Slide

"The original boulevard was constructed on a fill built across a ravine in the hills. During its construction the material slipping down endangered the Pennsylvania railroad tracks at the foot of the slope and an injunction was secured by the railroad company. The difficulty was overcome by the construction of a retaining wall. As the fill progressed additional precautions became necessary and a timber crib, probably filled with rock, was built higher up the slope to relieve the overcharge on the retaining wall. While some attempt was made to drain the fill and to carry off water that had access to the slope, the drawings exhibited show that it was not adequately accomplished and this is confirmed by the consistency of a part of the material being removed by the steam shovels.

"The saturated condition of the material, due to lack of proper drainage, combined with overloading the bank resulted in overcoming the resistance offered by the crib and retaining wall caused the slide. While the additional load was undoubtedly the straw that broke the camel's back, I have no doubt from the fluidity of part of the mass that it was only a question of time when the slide would have occurred.

"There is nothing that now can be done to stop the movement; the only thing remaining is to dig out the material as it reaches the lower level. No satisfactory method can be devised or used to reduce the weight on top.

"From Mr. Richey's records I agree with him that upheaving of the tracks at the foot of the slope is caused by the forward movement of the mass of the retaining wall which remains intact, shoving the material out ahead of it, similar to the action to a plow. The present indications are that this upward movement will cease when the old retaining wall is removed.

"It is difficult at this time to say what the exterior limits of the slide will be. All the material within the cracks that now appear on the ground will move, and the bulk of it will have to be taken out. As the material move out, allowing a settlement at the top, additional cracks may develop and will then become the bounding lines for the slide or unstable area. I should not be surprised if it took in all of the material in the old ravine up to the retaining wall in the rear of the stable.

"Efforts should be made to keep all the water possible from the slide area and none of it should be allowed to stand in pools on the surface if it can be carried off economically. Cold weather may, to some extent, retard the movement, but unless water is kept off freezing is liable to produce additional difficulties.

"The situation is serious from the railroad standpoint, not so from the highway standpoint. The engineers can proceed with their borings to determine the location and character of rock over all of the area except that which is in motion, and with the preparation of their plans based on the data obtained, so that there need be no delay in the preparation of the budget."

Efficient Shovel Operation Difficult

The work of removing the material continued day and night, but due to the many interruptions resulting from destroyed tracks, necessary train operation, etc., efficient steam shovel operation was exceedingly difficult to maintain. The normal capacity of the shovels under ordinary circumstances would have been about 30,000 cu. yd. a day, but considering the many difficulties which had to be overcome it was only possible to secure an average of 6,000 to 7,000 cu. yd. At the time of the clearing of the last two tracks a total of between 110,000 cu. yd. and 115,000 cu. yd. had been removed since the start of the slide on October 29.

With the advent of drier and slightly colder weather the advance of the slide decreased greatly, and the rate of movement fell from a maximum of one foot per hour to an approximate minimum of about ½ in. or less per hour. Every attempt has been made and is still being made to carry off any water which might accumulate or work its way into the material remaining in the gully. While there is still some movement, it is believed that unless heavy rains start that the slide is well under control, though not necessarily near its end. Test holes are now being drilled at different locations to ascertain the probable depth at which bed rock is located. Prospective plans for future work at this point are now taking into consideration either the construction of a new retaining wall which extend down to bed rock, firmly anchored thereto, and the gully again filled or the building of a viaduct across the ravine and the abandoning of the fill.

The work of the Pennsylvania has been under the direction of W. D. Wiggins, chief engineer maintenance of way of the Central region, while the actual work in the field has been under the control of C. W. Richey, division engineer. The work of the city has been under the direction of John Swan, director of public works, and N. S. Sprague, chief of the bureau of engineering.

Lehigh Valley Combination Ordered Dissolved

WASHINGTON, D. C.

THE SUPREME COURT of the United States in a decision rendered on December 6 ordered the dissolution of the combination effected through intercorporate relations between the Lehigh Valley Railroad, the Lehigh Valley Coal Company, Coxe Brothers & Co., Inc., the Delaware, Susquehanna & Schuylkill Railway and the Lehigh Valley Sales Company, with such provisions for the disposition of all shares of stock, bonds or other evidences of indebtedness and of all property of any character of any one of said companies owned or in any manner controlled by any other of them as may be necessary to establish their entire independence of and from each other. The decision was rendered on the ground that the combination has constituted a restraint of trade in violation of the Sherman anti-trust law and has resulted in a violation of the commodities clause of the interstate commerce act. The decision of the court reversing that of the lower court was unanimous on the part of the seven members participating. Justices Brandeis and McReynolds took no part in the consideration of the case and Chief Justice White and Justice Holmes, while concurring in the decision, did so because of previous decisions of the court and not because of their present views, it was stated.

After reciting the history of the case and of the company's organization, the court said that the coal company was organized and conducted as a mere agency or instrumentality of the railroad company for the purpose of avoiding the legal infirmity which it was thought might inhere in the owning of coal lands and in the conducting of coal mining, shipping and

selling operations by the railroad company, and that the policy of purchasing and leasing coal lands tributary to its lines for the purpose of controlling interstate trade and commerce in anthracite coal and of preventing and suppressing competition therein was deliberately entered upon by the railroad company and, in combination with its agency, the coal company, was consistently pursued with increased energy and scope after the passage of the anti-trust act until the commencement of this suit, unless these purposes and results in point of law were modified and cured by the organization in 1912 of the sales company. The court then proceeded to discuss the latter point.

The decision continues in part as follows:

It is too plain for discussion that with a company thus organized and officered, the making of a contract by the coal company for the sale of all of its coal to the sales company was, in substance and effect, making a contract with itself, the terms of which it could determine in its discretion.

Immediately after the organization of the sales company the anticipated contract between that company and the coal company for the purchase of all the coal which the latter might mine or purchase was entered into and bears date March 1, 1912. This contract was to continue for 10 years unless terminated in the manner which it provides for, and its terms so nearly identical with the earlier Lackawanna contract, which is considered in United States c. Delaware, Lackawanna & Western R. R. Co., 238 U. S. 516, that the judge who tried this case below, with entire propriety, says that the differences between the two are wholly unsubstantial (225 Fed. Rep. 401). This court held that the contract in the Lackawanna case was void because violative of the provisions of the anti-trust act and the commodities clause of the act to regulate commerce.

The discussion of the Lackawanna contract is so full and satisfactory in 238 U. S. 516, that it would not serve any useful purpose to comment in detail upon the contract which we have here.

It will suffice to say that the provisions of the Lackawanna contract, which were clearly determinative of the former decision by this court, are plainly the same in substance, and almost exactly the same in form, as those in the contract we are considering, viz: The agreement of the coal company (1) to sell and of the sales company to buy all of the coal mined by the coal company from lands owned or leased by it, together with all coal which it might purchase; (2) that the prices to be paid for the more important grades of coal shall be 65 per cent of the New York prices—the two contracts are in precisely the same words in this respect; (3) that, with negligible exceptions, the sales company is to sell no other coal, for itself or for any other, than that purchased from the coal company; (4) that the coal company shall lease all of its facilities, structures and trestles to the sales company; (5) that either party shall have the right to abrogate and cancel the contract upon giving to the other six month's notice of its desire so to do; (6) that the sales company shall not buy coal except from the coal company—a provision which excludes the sales company, potentially a strong competitor, from the market. The coal company purchased 2,960,000 tons of coal in 1911 in addition to that which it mined.

These are the contract provisions which led this court, in the former case, to hold that a corporation organized and circumstanced as is the sales company which we have here—subject to be stripped at the will of another of all of its business and of all of its facilities for carrying on the business for which it was incorporated was neither an independent buyer nor a free agent.

Being entirely satisfied with the reasoning upon which the Lackawanna case proceeds to its conclusion, we hold now, as it was there in principle held: that the purchase in form by the sales company did not so dissociate the railroad company from the transportation of coal in which it was interested as to meet the requirements of the law, that the contract, nominally of purchase, was so calculated to restrain interstate trade as to be obnoxious to the anti-trust act of Congress, and that for this reason it is unlawful and void.

It will be of service in determining the purposes of the defendant railroad company with its corporate subsidiaries in the activities thus discussed, to recall the history of the defendant railroad company, as it appears in the decisions of this and of other courts.

In 1892 the defendant railroad company and the Central Railroad Company of New Jersey leased their lines of railway for the term of 999 years to the Reading Railroad Company, a parallel competing carrier extensively engaged in mining, marketing and selling anthracite coal. This combination, had it become operative, would have gone far toward monopolizing the interstate transportation and trade in anthracite coal of our entire country, but all operations under the lease of the Central Railroad Company of New Jersey were enjoined by the New Jersey courts, for the reason that it was deemed to be in restraint of trade, against public policy and calculated to partially destroy competition in the production and sale of anthracite coal, a staple commodity of the state. Thereupon the lease of defendant's property was abandoned and surrendered.

Six years later, in 1898, the defendant railroad company combined with the Reading and four other railway companies to contribute a large sum of money, which was successfully used to prevent the construction of a projected, competing line of railroad from the anthracite fields to tidewater. Of this enterprise this court said: "We are in entire accord with the view of the court below in holding * * * that the transaction involved a concerted scheme to combine for the purpose of restraining commerce among the states, plain violation of the act of Congress of July 2, 1890."

Four years later, in 1902, the defendant railroad company united with the Reading and four other anthracite carriers in a combination to control the entire tonnage of coal produced by independent operators along the lines of their respective railways. The device this time resorted to was a contract to purchase all the coal produced by independent mines, then opened or which might thereafter be opened by the vendors, and to pay therefor 65 per cent of the market price prevailing at tidewater points at New York, to be computed from month to month by an arbitrator to be selected by agreement. These contracts were elaborately considered and unsparingly condemned by this court in the case which is cited, and the conclusion reached was that the defendants in that case had unlawfully combined, by and through the instrumentality of the 65 per cent contract, for the purpose of controlling the sale at tidewater of the independent output of anthracite coal. The contracts were declared to be unlawful and were ordered cancelled.

In 1911, in Meeker & Company v. Lehigh Valley R. R. Co., 21 I. C. C. 129, 154, 163, the Interstate Commerce Commission held that the only line of demarkation between the Lehigh Valley Railroad Company was one of bookkeeping; that the railroad company "had monopolized the coal field served by it" and that it had been guilty of unjust discrimination and of charging unreasonable rates for which reparation was awarded. This decision was sustained by this court in Meeker & Company v. Lehigh Valley R. R. Co., 236 U. S. 412.

And yet again, in 1915, the Interstate Commerce Commission, after an investigation extending over three years, in which the defendant railroad company and all other initial carriers of anthracite were parties, held that the rates charged by the defendant and other carriers to tidewater and to certain interior points were unreasonable; that by trackage and other arrangements they had extended advantages to their subsidiary coal companies, to the prejudice of other shippers; and that concessions as obnoxious as direct cash rebates had been made to such coal companies.

This history of almost 25 years casts an illuminating light upon the intent and purpose with which the combination here assailed was formed and continued.

Without further comment, this discussion of the record requires us to conclude that it is clearly established that prior to the enactment of the anti-trust act, the railroad company, in combination with its coal company subsidiary, deliberately entered upon a policy of making extensive purchases of anthracite land tributary to the railroad company's lines, for the purpose of controlling the mining, transportation and sale of coal to be obtained therefrom and of preventing and suppressing competition, especially in the transportation and sale of such coal in interstate commerce, and that this policy was continued after the passage of the anti-trust act with increasing energy and tenacity of purpose, with the result that a practical monopoly was attained of the transportation and sale of anthracite coal derived from such lands.

The area of the anthracite territory is so restricted that to thus obtain control of the supply of such coal on a great system of railway (the amount transported exceeded one-fifth of the entire production of the country for the year before this suit was commenced) by a combination of corporations, such as we have here, and by such methods as we have seen were employed, effected a restraint of trade or commerce among the several states and constituted an attempt to monopolize and an actual monopolization of a part of such trade or commerce in anthracite coal, clearly within the meaning of the first and second sections of the anti-trust act as they have frequently been interpreted by this court.

Since we have also found that the contract between the coal company and the sales company was a mere device to evade the commodities clause of the interstate commerce act and therefore

void, it results that the decree of the district court must be reversed and the case remanded with instructions to enter a decree, in conformity with this opinion, dissolving the combination effected through the intercorporate relations subsisting between the Lehigh Valley Railroad Company, the Lehigh Valley Coal Company, Coxe Brothers & Company, Inc., the Delaware, Susquehanna & Schuylkill Railroad Company and the Lehigh Valley Sales Company, with such provisions for the disposition of all shares of stock, bonds, or other evidences of indebtedness, and of all property of any character, of any one of said companies owned or in any manner controlled by any other of them as may be necessary to establish their entire independence of and from each other. The contract of March 1, 1912, between the coal company and the sales company must be decreed to be void and all contract relations between the two companies enjoined which would serve in any manner to render the sales company not entirely free to extend its business of buying and selling coal where and from and to whom it chooses with entire freedom and independence, so that it may in effect, as well as in form, become an independent dealer in coal, and free to act in competition, if it desires, with the defendant coal company or railroad company.

As to the New York & Middle Coal Field Railroad & Coal Company the G. B. Markle Company, the Girard Trust Company and the individual defendants, the bill must be dismissed.

That the Lehigh Valley has during the past four years operated its coal properties in conformity with the ruling of the Supreme Court in the case of the Delaware, Lackawanna & Western was the assertion of E. E. Loomis, president of the Lehigh Valley. That this fact had no bearing in the recent ruling which calls for segregation of the Lehigh Valley's coal properties developed when Mr. Loomis pointed out that the court's decision was based solely on evidence submitted six years ago.

Mr. Loomis indicated that the decision of the court was somewhat of a surprise in view of the knowledge on the part of that company's officials that a general cleaning up process had been started several years ago and that at the present time the company was being operated in strict conformity to the law. It was intimated that had the attorney of the Lehigh been given an opportunity to submit new evidence the ruling might have been altered.

Mr. Loomis also stated: "It appears that we have a busy winter ahead of us between studying how to form combinations as the new Transportation Act provides and to break up combinations which have existed more than a quarter of a century but which the Supreme Court now declares a monopoly in restraint of trade as a result of a suit instituted over six years ago."

It was pointed out also that at present one-third of the coal of the Lehigh Valley is handled by independent operators.

Hearing on Maintenance Allowance

A HEARING WAS HELD before the Interstate Commerce Commission at Washington on December 4 on the application of Paragraph 3 of Section 209 of the transportation act relating to the allowance for maintenance to be made during the six months' guaranty period from March 1 to September 1 in computing the net operating income guaranteed to the carriers. Briefs filed with the commission on this subject by the Association of Railway Executives and the Railroad Administration were abstracted in the *Railway Age* of September 3, page 397. The arguments made at the hearing were in general along the lines followed in the briefs. Arguments were made on behalf of the railroads by Alfred P. Thom, general counsel of the Atchison, Topeka & Santa Fe, and chairman of the adjustment committee of the Association of Railway Executives, while the argument on behalf of the Railroad Administration was made by J. C. Davis, its general counsel.

The principal contention of the railroads was that the maintenance allowance, as well as the director general's obligations to maintain the railroads during the period of federal control, should be based on the sum necessary to produce the physical equivalent of the maintenance work performed during the test period, while the Railroad Administration argued that the provisions of the standard contract which also govern the maintenance allowance for the guaranty period, provide for an accounting test of the sufficiency of the expenditures made.

Mr. Thom made the contention that the engineering test should be applied so far as practicable and that the money test should be applied to items as to which the actual physical reparation cannot be definitely measured. The railroads also contended that the equation of expenditures for maintenance to represent increases in the cost of labor, materials, etc., should also be applied to depreciation.

Mr. Davis, on behalf of the Railroad Administration, said that the differences between the railroads and the administration as to the interpretation of the maintenance provisions of the standard contract represent a possible difference of $1,000,000,000. The gross amount asked of the Railroad Administration by eight large railroads whose claims are now under consideration is $203,943,000, of which $138,000,000 represents claims for maintenance, a great part of which depends upon the construction placed upon the word "cost" instead of "price" in the standard contract. Mr. Davis pointed out the great difference in maintenance standards and conditions on different roads and the difficulty of applying the engineering test to maintenance. He said that one railroad in Mississippi had based its claim on an affidavit of an expert who had been over the line at the time the road was taken over by the government and who went over it again immediately after the termination of federal control and stated that it would cost about $3,000 a mile to put the road in the condition in which it was taken over, or a total of $1,800,000. He also referred to the wide differences in the claims made by the different railroads as to the inefficiency of labor during the period of federal control. He said that perhaps because of the different conditions during the period of federal control a railroad did not need the same quantity of rail as was placed on it during the test period, but needed something else and it was necessary to use the accounting test to determine whether the expenditure of money for some other purpose was the equivalent of the expenditure which might have been made for rail.

In arguing that depreciation accounts should be equated up, Mr. Bledsoe said that, for illustration, the Railroad Administration had used up the equivalent in years of car life of 4,300 cars on the Santa Fe without replacing a car. It had allocated new cars to the company at the increased cost, but was willing to pay for depreciation only an amount based on the original cost of the cars. Members of the commission pointed out that if the railroads had remained in control of their properties they would have continued to charge depreciation at the old rates, but Mr. Bledsoe and Mr. Thom argued that the obligation of the government under the standard contract did not depend on what the railroads would have done.

THE WATER SERVICE DEPARTMENT of the Illinois Central, in an effort to check waste, has prepared a graphical chart showing the consumption of water at the various terminals on the basis of the quantity used per engine handled during the year. This chart, which was prepared from meter records without advance notice shows a consumption ranging from 8,300 gal. per engine handled to 15,100. By presenting this information graphically and distributing the comparative results to all divisions, interest in the detection and elimination of wasteful practices is encouraged.

Takes Issue with the Farmers' National Council

Association of Railway Executives Refutes Assertions Relative to Railways Made by G. P. Hampton

IN A LETTER TO A NUMBER of the important farmers' organizations of the country, T. DeWitt Cuyler, chairman of the Association of Railway Executives, has called attention to the weakness of certain arguments advanced by the Farmers' National Council in a recent letter to several of the more conservative associations of farmers, in which it advocated, among other things, "government ownership and operation of the railroads for service and not for profit."

The letter of the National Farmers' Council alleges that the farmers of the country are being compelled to pay about $900,000,000 annually in higher rates, which they say, would not be necessary if the railways were owned and operated by the government instead of by private owners who, "emboldened by their success in securing a 6 per cent. guaranteed dividend upon the aggregate value of the roads, including billions of watered stock, are requesting that they may be granted a higher dividend." Mr. Cuyler, in his letter, points out the weakness of the council's contention and shows wherein the railways are being operated with greatly increased efficiency under private control.

The organizations addressed by the Farmers' National Council and Mr. Cuyler in their letters are International Farm Congress, Kansas City, Mo.; American Farm Bureau Federation, Chicago; National Grange, Fredonia, N. Y.; National Farmers' Union, Union City, Ga.; National Milk Producers' Association, Coldwater, Mich., and Farmers' National Congress, Kearney, Neb.

The Farmers' National Council Letter

The letter of the Farmers' National Council is signed by George P. Hampton, managing director, and that part of it relating to railways reads as follows:

"The average increase in freight rates of nearly one-third necessitated by the return of the railroads under the conditions of the terms of the Cummins-Esch law, has placed a crushing burden upon the American farmers. Farmers pay at least 40 per cent. of the general freight revenues of the railroads, as they constitute close to 40 per cent of the population. In addition, they have to pay all the freight on shipments of farm products, since farmers can not fix prices of their products. The Cummins-Esch bill, therefore, compels farmers to pay directly about $900,000,000 more a year than would be necessary under unified government operation of the roads for service and not for speculative profit, even if there is no further increase in freight rates. The recent increase in rates has resulted in reducing the gross revenues of the railroads, by reducing shipments and travel, so that there is a considerable deficit, and the owners of the railroads, emboldened by their success in securing a 6 per cent. guaranteed dividend upon the aggregate value of the roads, including billions of watered stock, are requesting that they may be guaranteed a higher dividend which in all probability will necessitate an increase in freight rates to an average of 40 to 50 per cent. for the country, over the rates charged during the war. You, of course, know what a blow such an increase would be to farmers, yet unless the roads are restored to unified government operation, there is no escape from precisely such an increase. The Interstate Commerce Commission recently reported that six months of private operation of the railroads, from March 1 to September 1 of this year, will cost the taxpayers $656,000,000. The total deficit under war-time conditions during twenty-six months of federal control of the railroads, was about $902,000,000, including the excessive rentals paid by the government, estimated at about $500,000,000 for the period. It is clear, therefore, that six months of private operation of the railroads have cost the American people considerably more than two-thirds as much as twenty-six months of federal control of the railroads. This six months of private operation has cost farmers directly over $400,000,000. In addition, do we need to remind you that the farmers have not secured adequate service since the return of the railroads to private competitive operation, and that the unavailability of freight cars, not so much due to the actual shortage of cars as to the fact that under private operation they could not be pooled and used where needed, thereby increasing their effectiveness, has caused the farmers scores of millions of dollars of losses through inability to move their crops promptly.

"Will your organization officially work for legislation to restore the railroads to government operation, and for government ownership with a clear majority of the board of directors appointed by the government representing the public, and all economies effected through unified operation and co-ordination of equipment to insure to the benefit of the American people?

"This would save American farmers, unquestionably, at least $900,000,000 a year directly, and two or three times that amount indirectly, and permit paying railroad employes fair living wages."

Mr. Cuyler's Refutation

Mr. Cuyler's letter to the farmers' organizations follows:

"I understand that on or about November 10 there was addressed to you a letter by Mr. George P. Hampton, managing director of the Farmers' National Council, in which, among other things, he asked you to place your organizations behind the movement for so-called "government ownership and democratic operation of the railroads for service and not for profit." In urging this course upon you, Mr. Hampton made a series of misstatements which I think it is due to you to have corrected.

"In the first place, he states that the Cummins-Esch bill is responsible for the recent increase in freight rates. Of course, the truth is that an increase in freight rates would have been necessary in any event, whether the government had retained the railroads or whether they had been returned to private operation. That increase would have been necessary because the cost of railway operation had so increased that the rates in effect prior to the recent increase were no longer capable of making the railroads self-supporting, either in the government's hands or in the hands of their owners.

"He next states that the railroads succeeded in securing a 6 per cent guaranteed dividend upon the aggregate value of the railroads, including billions of watered stock. The railroads have no 6 per cent guaranteed dividend whatever. The Cummins-Esch bill, now known as the Transportation Act, 1920, directs the Interstate Commerce Commission to fix rates at such a level as will permit honestly, efficiently and economically operated railroads to earn either 5½ or 6 per cent, in its discretion. The basis upon which these earnings are allowed are not the securities of the railroads, but the actual value of the property which they are devoting to the public service of transportation, and the Interstate Commerce Commission has already ascertained that the aggregate value of that property is not less than $18,900,000,000, and it has

set rates which it hopes will enable the carriers to earn 6 per cent upon this amount with the most efficient operation. But, whether any carrier succeeds in earning this is entirely due to its own efforts.

"He next states that the railroads are requesting they be granted a higher dividend. This statement is entirely untrue. Putting aside his misuse of the word 'guaranteed,' the railroads have made no request for rates in excess of those which have been established by the Interstate Commerce Commission, and are loyally co-operating in trying to carry out the Transportation Act in good faith, and to so increase the efficiency of operation as to earn a 6 per cent income out of existing rates.

"I know of no report of the Interstate Commerce Commission stating that the six months of private operation of the railroads from March 1 to September 1 will cost the taxpayers $656,000,000. You will recall that, when the railroads were returned to private operation, rates were entirely inadequate, and equipment and property somewhat deteriorated, and that the government therefore established the six months above referred to as a 'transition period,' during which it undertook to assure to any railroad company desiring it a six months' income identical to that which it received during the period of federal control. It is true that the railroads failed to earn that income by about $668,000,000. Whether or not this was due to the inferiority of private operation as opposed to government operation, I leave for you to judge from the following facts:

"1. On July 20, 1920, the United States Railroad Labor Board awarded an increase in wages for railroad employees amounting to approximately $625,000,000 a year. These increases were retroactive to May 1, 1920. During the four months from May 1 to September 1, they added approximately $208,000,000 to the operating expenses of the railroads. This was done by government authority, and presumably would have been granted to the railroad employees whether they had been in the employ of the railroad companies or in the employ of the government.

"2. During the six months from March 1 to September 1, 1920, the railroads expended $175,000,000 more than during the same six months of last year in increased maintenance of roadway and structures essential toward partially restoring the properties to more efficient condition.

"3. During the six months from March 1 to September 1, 1920, the railroads spent approximately $220,000,000 more in maintenance of equipment than during the similar six months of 1919. This was necessitated by the fact that approximately 27½ per cent of the locomotives of the country were in bad order and unfit for operation, and approximately 6½ per cent of the cars.

"Therefore, approximately $600,000,000 of the $668,000,000 deficit from March 1 to September 1 was either paid out for wages increased by government authority, or to make good a part of the deterioration caused by the war during the period of federal control.

"It is, therefore, not in the least clear, but obviously quite untrue, that six months of private operation of the railroads have cost the American people considerably more than two-thirds as much as federal control of the railroads.

"Mr. Hampton also reminds you that the farmers have not secured adequate service since the return of the railroads, and states that the unavailability of the cars was not to much due to actual shortage, but to the alleged fact that under private operation they could not be pooled and used where needed.

"It is true that for some six or seven months there has been a gradually lessening shortage of cars. This was not at all due to the alleged fact that they could not be pooled and used where needed. On the contrary, when the railroads resumed private operation, they took over intact the Car Service Section of the United States Railroad Administration and constituted it a Car Service Commission, and the distribution of cars has been carried out throughout the entire period with primary reference to the amount of equipment available of various kinds and the needs of different portions of the country for this equipment at different times.

"During the course of private operation, during the last eight months, the railroads moved 162,056 open-top cars from the West to the East, in order to keep up the production of coal; and from July 1 to November 4 they moved 129,630 box cars from the East to the West, for the purpose of carrying grain and other farming products.

"When the government ceased operating the railroads on March 1, there was an accumulation of loaded but unmoved freight cars amounting to 103,237, which, during the outlaw switchmen's strike, increased to the great sum of 288,152. On October 29 this accumulation had been reduced to 40,040, and on November 12 to 30,735 cars. So that, in substantially eight months of private operation, the entire congestion of the railroad system has been cleared up.

"This has been done not by adding billions of dollars to the capital investment account of the railroads, on which the public has to pay a return through rates, and would have to pay a return in some form even under government ownership, but by increased efficiency.

"When the government ceased operating the railroads, the average mileage per car per day was 23.3. On the first of October the railroads had raised this to 28.1. Each additional mile on the average daily movement is equivalent to the work of 100,000 additional freight cars moving a mile less per day. By increased rapidity of movement, therefore, which was only possible thanks to the great expenditures on maintenance of equipment previously referred to, the railroads added the equivalent of over 400,000 additional freight cars, without the addition of a dollar of capital investment.

"When the government ceased operating the railroads, the average load per car was 28.3 tons. On the first of October the railroads had raised this to 30 tons. Every ton added to the average load of the freight cars of the country is equivalent to adding some 60,000 to 70,000 cars loaded a ton less, and by this heavier loading, the railroads have therefore added the equivalent of some 100,000 additional freight cars. Taking faster movement and heavier loading together, the railroads under private operation, by increased efficiency, have given the country the benefit of the equivalent of substantially 500,000 additional cars. If this increase in the transportation capacity of the railroads had had to be provided by the purchase of 500,000 new cars, with the necessary quota of locomotives, it would 'have added something like two and one-half billion dollars to the property investment account of the railroads on which the public would have to pay a return, through rates. The fact that the investment of this stupendous sum was made necessary, and that this increase in transportation capacity was manufactured out of improved efficiency, instead of out of additional cars and locomotives, is one of the genuine and striking savings accruing to the country from the resumption of private operation.

[Mr. Cuyler here quoted a part of an address delivered by Clyde B. Aitchison of the Interstate Commerce Commission before the National Association of Railway and Utilities Commissioners at Washington on November 10, pointing out the effects of the outlaw strikes in April and the improvement in service subsequent thereto.]

"In writing this letter I am not attempting to argue the question of government ownership. If you are interested in discussing it, we shall be glad to discuss it with you, but the purpose of this letter is to put you in possession of certain plain facts, all of which are matters of public record, and any of which could have been ascertained by Mr. Hampton before he wrote you."

William J. Harahan

WILLIAM J. HARAHAN, formerly president of the Seaboard Air Line, was, on December 7, elected president and a director of the Chesapeake & Ohio and the Hocking Valley, succeeding the late George W. Stevens. Mr. Harahan is an executive of wide experience. He has had training in both the operating and engineering departments and has held important executive positions with three large railway systems. He was at one time, fourth vice-president and general manager of the Illinois Central and later, vice-president of the Erie, in charge of engineering. He was elected president of the Seaboard Air Line in September, 1912, and during the period of Federal control, was continued in charge of the operation of the property as Federal manager.

Mr. Harahan will occupy a position on the Chesapeake & Ohio similar to that which he held on the Seaboard, to the extent that he will be the operating head of the property reporting to a chairman of the board in New York. In his new position, however, he should have a considerably wider scope for his abilities as a railroad manager. The Seaboard Air Line has 3,563 miles of line as compared with the Chesapeake & Ohio's mileage of 2,506, it is true, but the operating revenues of the former in 1919 were $41,183,532, as compared with operating revenues of the latter totaling $71,475,016. This is excluding from our comparison the Hocking Valley, which, operating 350 miles of line, had, in 1919, operating revenues of $11,654,517. This indicates a great difference in traffic density per mile of line as between the Seaboard and the Chesapeake & Ohio systems, but it only begins to state the problem that lies before the new operating executive. The development of the Chesapeake & Ohio of late years has been, comparatively speaking, extensive rather than intensive. The present or the next step is to carry out the work of intensive development of its mileage.

W. J. Harahan

There are two things in particular that stand out in Mr. Harahan's career. One is his popularity with his men and the respect that he has been able to secure from those who work with him. This is the result of a pleasing disposition combined with the fact that, having worked up through the ranks, he understands the attitude of the railway employees and knows how to get them to do their best for the railroad for which they work. The other point in his career has been that he has had to work in recent years under somewhat adverse conditions. Neither the Erie nor the Seaboard Air Line is a rich road. Mr. Harahan's experience with them has shown him how to get the most out of a railroad dollar and how to make a little money go a long way. The Chesapeake & Ohio is not a poor road, but no one would deny that this training should prove of value to Mr. Harahan in his new work notwithstanding.

George W. Stevens, the late president of the Chesapeake & Ohio, was an able operating man. He was in absolute charge of the operation of the road and the discretion allowed him by his principals, whoever they may have been, was great. It will be borne in mind that during his 30 years as the operating head of the road, the property was in successive control of no less than three different interests, not counting the Railroad Administration. Mr. Stevens was well liked and popular with officers and men alike and the loyalty which he inculcated on the road was noteworthy. Mr. Harahan succeeds to these things and should be able to continue equally happy conditions.

The Chesapeake & Ohio is one of the most important coal carriers in the United States. On this railroad the bituminous coal tonnage is approximately 65 to 70 per cent of all the freight. Naturally the intensive development work referred to above, will deal with the handling of coal. The Chesapeake & Ohio is now going through something of a transition period with its coal traffic. Its coal comes from four regions. The most easterly of these is the New River district, supplying about one-quarter of the total tonnage. This coal is a low volatile fuel; it moves east, principally, and makes up a large proportion of the coal delivered to coastwise vessels at Newport News. It does not now play as important a part in the road's coal traffic as it once did. There has been a considerable decrease in the tonnage originating on the Chesapeake & Ohio in this region and naturally it supplies a smaller percentage of the total tonnage moved. The other three districts in the order of their importance are the Logan, Kanawha and Kentucky fields. These fields supply a high volatile coal which has been found in special demand for export trade and which of late has seen considerable development for use as a by-product coal. The coal from these fields supplies the better part of the westbound movement—to Cincinnati and beyond or to the lake ports and territory served by the Hocking Valley. The interesting feature to which particular attention should be drawn is the increasing amount of this coal moving east. The dumpings at Newport News this year have broken all records, totaling, for the first ten months of 1920, over 7,000,000 tons. Something like 60 per cent of the coal dumped has been for export trade.

This brings attention to the advantageous position the Chesapeake & Ohio is in to handle export trade, not only in coal, but in other commodities. The newest coal pier at Newport News is of the most modern type. Hampton Roads is pre-eminently the tidewater coal center, whether for export, bunker or coastwise trade. The Chesapeake & Ohio should be able to hold its own with the Norfolk & Western and the Virginian in this trade. The Chesapeake & Ohio has a considerable number of 55 and 70-ton cars in use in its coal traffic to tidewater, and has recently ordered some 100-ton cars, which will no doubt enable it to handle this coal even more efficiently in the future than it has in the past.

Mr. Harahan will have before him the development of the

Chesapeake & Ohio to the west as well as to the east. The Chesapeake & Ohio owns the Hocking Valley and has derived great benefit from this ownership. Traffic from the former to the latter moves over the Chesapeake & Ohio Northern and thence over the Norfolk & Western, reaching the Hocking Valley at Columbus; it is understood that it is contemplated eventually to extend the Chesapeake & Ohio Northern to fill this gap now bridged by the Norfolk & Western. The building up of traffic on the Chesapeake & Ohio of Indiana, the system's connection between Cincinnati and Chicago, is another problem confronting Mr. Harahan, and as to its being a big one there is no question. The owners of the Chesapeake & Ohio feel that many sections of the road are being called upon to handle a considerably greater traffic than that for which they are best fitted. A big program of physical improvements is in contemplation, and it is not unlikely that in securing Mr. Harahan the directors had in mind that he had had considerable engineering experience. In this connection it should be noted that on account of his early connection with the Chesapeake & Ohio as a division engineer, Mr. Harahan acquired an intimate knowledge of some of the most important physical characteristics of that railroad. Due to the proximity of the Seaboard Air Line to the Chesapeake & Ohio, and the fact that large quantities of fuel coal required by the Seaboard have originated on the Chesapeake & Ohio, it may be assumed Mr. Harahan is intimately acquainted with the current situation on the road of which he has now become president, and appreciates that the most vital problem of that railroad is to provide a more adequate outlet for a coal territory that is developing with great rapidity. The conditions on the Chesapeake & Ohio and Mr. Harahan's knowledge of these conditions, combined with his particular combination of engineering and operating training, would seem to make the choice of him for president most fitting.

William J. Harahan, like other well-known railroad executives of the present generation, has qualifications which cannot be learned in the schools: either the university or the school of experience, for he was the son of an all-round operating officer. Such boys begin their railroad education from five to fifteen years earlier than is possible with boys less favored—long before they can begin to have "experience"—and their superior mental equipment, though usually not measurable on the surface, always counts. The elder Harahan's career as president of the Illinois Central, preceded by many year's experience on other prominent roads, his leading position in the American Railway Association and his tragic death in January, 1912, will be remembered by our older readers.

William J. Harahan was born December 22, 1867, at Nashville, Tenn. He began railway work in 1881 as a messenger and clerk in the superintendent's office of the Louisville & Nashville at New Orleans. In 1884 he went as apprentice into the Louisville & Nashville shops, and in 1886 into the engineering department. For two years, beginning in 1889, he was engineer of maintenance of the Cincinnati division of the Chesapeake & Ohio. In 1890 he was placed in charge of structures on the Baltimore & Ohio Southwestern, and two years later became roadmaster and trainmaster of the Pontiac division of the Illinois Central. In April, 1895, he was appointed assistant superintendent of the Freeport division, and in October of the same year, superintendent. In 1896 he became superintendent of the Louisville division, and in May, 1901, was appointed chief engineer of the Illinois Central. A little over a year later he was appointed assistant general manager, in 1904 general manager, and, in 1905, fourth vice-president and general manager. He was appointed assistant to President Underwood of the Erie in 1907 and was later elected vice-president in charge of engineering. He was elected president of the Seaboard Air Line in September, 1912, and served as federal manager of that property during the period of federal control.

Hearing on Car Distribution "Graft" Charges

WASHINGTON, D. C.

GIBBS L. BAKER, a Washington attorney and general counsel for the New York Wholesale Coal Trade Association, who had been quoted in various newspapers as charging many irregularities in connection with the issuing of permits and the distribution of cars for the shipment of coal, was called as a witness at a hearing before Commissioner Aitchison of the Interstate Commerce Commission at Washington on December 4 in an investigation ordered by the commission as to the truth of the charges. The witness denied having made statements attributed to him in the newspapers and said he had only hearsay evidence of any irregularities. He testified to having been told in conversation of several specific instances of irregularities. Chief Counsel Farrell of the commission read newspaper interviews quoting the witness as stating that some mines were getting far more cars than their rating allowed, that car distributors for the railroads had received large sums in "graft," and that there were indications of collusion in the clerical force of the Interstate Commerce Commission itself. Mr. Baker denied having made the statements, but said he had discussed with some newspaper men certain statements that had been made to him by others regarding irregularities in the use of coal permits.

He said that at a hearing before the Tidewater Coal Exchange, which he did not remember very definitely, one coal company had been asked to explain why it had shipped to tidewater more coal than was allowed by its permit, and another company as to why it shipped coal on a permit issued to another company. He also said that William F. Coale, president of Coale & Co., had told him in conversation that the American Fuel & Shipping Company of Baltimore had obtained from the Baltimore & Ohio a permit for the shipment of approximately 100,000 tons of coal to tidewater for the account of Coale & Co., on a statement that certain ships were waiting for the coal, the names of the ships being fictitious, and that this permit had cost the company $4,000. He understood that the Baltimore & Ohio had made an investigation of the matter and he suggested the name of a witness whom the commission might call who would know more definitely about the case. On the strength of that information, he said he had doubtless said to newspaper men that there had been abuses by railroads and coal men of orders of the Interstate Commerce Commission. He also said he had been told by an assistant United States attorney at New York that car distributors had been receiving large sums of money from coal men.

Commissioner Aitchison asked the witness particularly about a statement quoted in the New York Herald referring to collusion among employees of the Interstate Commerce Commission. Mr. Baker said he had never heard of any such assertion and he had no reason to believe that any officer or employee of the Interstate Commerce Commission had anything to do with irregularities. Commissioner Aitchison said that there was no way in which any employee of the commission could add to or take away from the supply of cars to any mine.

The hearing was then adjourned, subject to further call.

A SURVEY of the transportation facilities of the Pittsburgh (Pa.) District is being made by the United States Department of Commerce. Inspectors of the Bureau of Foreign and Domestic Commerce of the department will study railroad facilities, inland waterways facilities, terminal costs, expense of loading and unloading, river transportation cost, etc. Col. James F. Bell, United States engineer in charge of the Pittsburgh District, is accompanying the government inspectors.

General News Department

The shops of the Southern Pacific at Houston, Tex.—the paint shop, air brake shop, storehouse and office—together with a number of cars, were badly damaged by fire on December 7. Estimated loss $350,000.

The Charleston Division on the Eastern Lines and the Ohio Division on the Western Lines of the Baltimore & Ohio are declared the winners in the recently closed 30-day no-accident campaign on that road.

The Pennsylvania Railroad reports for September that the time lost per 10,000 passenger car miles on account of car failures, fell from 5.1 minutes in April and 3.9 minutes in August, to 3.5 minutes in September. In September there was one car failure detention for every 45,700 car miles. The total number of passenger train detentions due to car failures was reduced from 994 in August to 841 in September, a reduction of 15 per cent.

The Northern Pacific has leased a part of its land holdings in Montana to an oil concern, which expects to make a thorough investigation of the property. The eastern extension of the anti-clinal structure of the Cat Creek oil field lies within the limits of the land grants of this road and although no wells have been completed in this territory, and there is no immediate activity, considerable work has been laid out for next season which should serve to disclose the presence of oil should it exist. There are nine wells now producing oil in the Cat Creek field, seven of these wells having been brought in with a flush production of over 1,000 barrels per day and the oil is of extremely high grade. The acreage of proven oil ground so far is quite small and the quantity of oil issuing from the present wells is gradually declining.

Two of Chicago's leading technical institutes, with the co-operation of the American Society for Steel Treating, will offer evening courses in the subjects of forging and heat treatment of steel. These courses are specially planned for the benefit of the practical men in the forge shop or heat treating departments or those who wish to qualify for such work. The course will embrace the following phases of the work: pyrometer, microscope, forging, annealing, alloy steels (dealing with the effects of different alloys and treatments upon the physical characteristics of steel), hardening and drawing of tool steel and case hardening. The plan and formation of this course was carried out by the Chicago chapter of the society through their educational committee and its seven sub-committees. The texts, lectures and demonstrations were prepared voluntarily.

The Southern Pacific has just completed a motion picture depicting graphically the story of oil, tracing its history from production to consumption. The film will be shown at all terminals and at principal points of the System as an aid in teaching the conservation of this product, of which the Southern Pacific uses 60,000,000 gallons a month, or about 16 per cent of all oil produced in California. The company, in notifying its employees of the picture, states that there is a message to be learned by all who see this film. Further, that the fuel industry faces a crisis; that those who depend upon the industry must take heroic measures if they would stave off disaster and that the picture shows what these measures are. It is further stated that the consumption of fuel oil now exceeds production by 30,000 barrels a day and reserve stocks in California are being depleted by 1,000,000 barrels a month.

A 33 per cent reduction in rear collisions is reported by the Pennsylvania for the year 1919, as compared with 1918, a fact which is taken to prove that such collisions can and should be presented. This fact, in a circular to employees, is supplemented by a quotation from Benjamin Franklin, the patron saint of Pennsylvania, embodying his well-known aphorism that "experience keeps a dear school, but fools will learn in no other." Continuing, the circular says that the fact that there are 10,000 accidental deaths and 175,000 injuries to passengers, employees and trespassers yearly on the railroads of the United States, most of which are preventable, proves the wisdom of this maxim. One of the illustrations in the circular, designed, evidently, as a hint concerning what classes of persons are pupils in the school referred to, shows the flagman of a halted freight train, who ought to be going back to stop following trains, sitting on the rail about ten feet back of his caboose, reading a newspaper.

A. S. C. E. Annual Meeting

The sixty-eighth annual meeting of the American Society of Civil Engineers will be held at the headquarters of the society, 33 West Thirty-ninth street, New York City, on Wednesday and Thursday, January 19 and 20, 1921.

British Syndicate to Operate Roumanian Railways

LONDON, BY RADIO.

It is definitely rumored in London that a British syndicate has completed preliminary negotiations to operate the Roumanian railways for a period of 35 years. It is said that locomotives will be ordered from Henschel & Company in Germany and that the German firm of Krupp will do the repairing of locomotives.

B. O. Cars Reduced

The Pennsylvania Railroad System has reduced the ratio of unserviceable freight cars to total freight cars on line from 11.9 per cent on October 1, 1919, to 3.6 per cent, as of October 1, 1920—10 per cent better than the 4 per cent which was set as a goal for the entire country by the Association of Railroad Executives. The average daily number of freight cars in bad order on the whole system has been brought down from 25,531 in March, 1920, to 10,136 in September.

New York Railroad Club Dinner

The New York Railroad Club will hold its second annual dinner at the Hotel Commodore, New York, on Thursday evening, December 16. The speaker of the evening will be James A. Emery, counsel of the National Industrial Council; his topic will be, "Transportation and the Public's Interest." The musical program will be in charge of Miss "Bobby" Besler. Reservations may be made through F. T. Dickerson, Central Railroad of New Jersey, 143 Liberty street, New York.

Mechanical Associations' Plan for Joint Exhibit

At a meeting of the official representatives of a number of minor railway mechanical associations and the associations of supply men exhibiting at the conventions of the railroad organizations, schedules were arranged for holding the conventions of a number of the associations at the Hotel Sherman, Chicago, during a continuous period of two weeks beginning September 6, 1921. The railroad organizations definitely committed to the plan are the Traveling Engineers' Association, the International Railway General Foremen's Association, the American Railroad Master Tinners', Coppersmiths' and Pipe Fitters' Association and the Chief Interchange Car Inspectors' and Car Foremen's Association. Others may possibly be included at a later date.

In order to carry out the details of the plan for conducting a continuous joint exhibit and to arrange for simultaneous meetings of some of the associations, a resolution was passed that a committee be organized consisting of a representative from each of

the railway and supply associations interested, to take care of features of the arrangements which would not regularly be handled by the individual associations, and that this committee be prepared to present a report at a joint meeting to be held in September, 1921, recommending the form of a permanent joint organization, if such an organization seems to be desirable.

American Association of Engineers

At the meeting of the national railroad council of the American Association of Engineers on November 27, the following resolution was adopted:

"Resolved, That the chairman of the national railroad council be authorized to arrange through proper channels to undertake a plan of establishing contact with the Association of Railway Executives for the purpose of developing an understanding with them relative to the position and status of engineers in railroad service, satisfactory and mutually advantageous to both."

It was also decided to appoint a sub-committee to consider revisions of the American Association of Engineer railway salary schedule, together with further classifications and a more elaborate statement of the duties of various positions and a more advantageous grouping of positions.

The Wood Preservers' Association

The following members have been nominated or the offices indicated or the ensuing year: For president, C. M. Taylor, superintendent treating plant, P. & R. and C. R. R. of N. J., Port Reading, N. J.; for vice-president, F. J. Angier, superintendent timber preservation B. & O., Baltimore, Md.; for second vice-president, H. S. Valentine, superintendent Eppinger & Russell Company, New York City; for secretary-treasurer, G. M. Hunt, U. S. Forest Products Laboratory, Madison, Wis. For members of executive committee for three years (two to be elected), Walter Buehler, engineer of wood preservation, the Barrett Company, New York City; R. J. Calder, secretary-treasurer, International Creosoting & Construction Company, Galveston, Texas; H. S. Sackett, assistant purchasing agent, C. M. & St. P., Chicago.

Labor Board Refuses Marine Employees' Demands

Marine employees of the Northwestern Pacific, the Southern Pacific, the Atchison, Topeka & Santa Fe, and the Western Pacific operating in the port of San Francisco, Cal., were denied increased wages by the United States Railroad Labor Board in a decision handed down on November 23. The men's demands were presented by the Masters, Mates & Pilots of America, the Marine Engineers' Beneficial Association, and the Ferry Boatmen's Union of California. The Board's decision is applicable to employees on railroad operated equipment in the port of San Francisco. The Board found that the wages now being paid and the rates which were in effect at the date of the termination of federal control were and are reasonable, fair and just. The Board did not undertake to consider or change the rules and working conditions.

Illinois Central Studies Electrification

The Illinois Central has appointed a commission to study electrification of the Chicago terminal facilities of that road and to advise on numerous technical questions involved. This commission will be composed of A. S. Baldwin, vice-president of the Illinois Central, chairman; D. J. Brumley, chief engineer of Chicago terminal improvements of the Illinois Central; Bion J. Arnold, consulting engineer, Chicago; George Gibbs, consulting electrical engineer. New York; Cary T. Hutchinson, consulting engineer, New York, and W. M. Vandersluis, formerly signal engineer of the Illinois Central, who will be engineering secretary of the commission. It is understood that the scope of work of this commission will be to consider and make recommendations on technical electrical problems arising in the electrification of the Illinois Central passenger and freight terminals in Chicago as outlined in an ordinance of the city of Chicago, passed July 21, 1919. These problems will include consideration of (1) the general trend of development in the various electrical propulsion systems and the probable influence of future development upon installation and operation of lines of the Illinois Central, and (2) the relative advantages of the alternative systems considered in connection with the electrification of (a) suburban service, (b) switching service and through freight service, (c) through passenger service, and (d) interchange with other railroads.

Tenth Anniversary of the Pennsylvania Passenger Station, New York City

Friday, November 26, marked the completion of the first ten years of the Pennsylvania Railroad station in New York City, and the use of the Hudson River tubes. The first train over the Long Island had started out of the terminal and through the East River tubes three months before. The through rail connection between New England and the South by way of the Hell Gate Bridge and the New York Connecting Railway, was put in service in April, 1917, and in January, 1918, the freight extension of the New York Connecting Railway to Bay Ridge, Long Island (opposite Greenville, N. J.), was opened to traffic.

The New York improvement of the Pennsylvania System had been authorized by the Board of Directors in 1902. In the ten years the number of passengers carried to and from the Pennsylvania station has increased over 200 per cent, or from 9,861,427 in 1911 to 30,343,205 in 1919. Pennsylvania Railroad traffic has increased 188.3 per cent and Long Island 214.2 per cent. The Long Island passengers are about two-thirds of the whole.

How the ferry has gone out of business as a passenger carrier is seen in the fact that in 1910, the last year of exclusive ferry service, the Pennsylvania ferries transported 9,372,028 rail passengers, while last year this dropped to 169,772 passengers. The Hell Gate bridge route, with four trains in each direction, carried, in October, 44,561 passengers.

October Earnings

Total operating revenues of 197 large roads for October, as reported to the Interstate Commerce Commission, show an increase of only 26.2 per cent as compared with October, 1919, in spite of the increase in rates and an increased volume of freight traffic. Operating expenses increased 28.8 per cent and net operating income increased 22.5 per cent. The 197 roads, operating 224,000 miles, had a net income of $88,169,565. The figures by districts are as follows:

	1920	1919	Per cent of income 1920 over 1919
Total operating revenues:			
Eastern District	$289,209,000	$219,522,664	31.7
Southern District	93,219,778	76,349,398	22.1
Western District	235,530,967	193,659,618	21.6
United States	617,959,745	489,531,680	26.2
Total operating expenses:			
Eastern district	243,955,895	184,526,505	32.2
Southern District	79,283,402	64,491,015	22.9
Western District	180,064,782	141,822,187	27.0
United States	503,304,079	390,839,707	28.8
Net income:			
Eastern District	32,167,807	23,436,640	37.3
Southern District	11,429,981	9,151,176	24.9
Western District	44,571,777	39,400,275	13.1
United States	88,169,565	71,988,091	22.5

	No. of roads represented	Average miles operated
Eastern District	78	58,741.52
Southern District	36	43,821.51
Western District	83	121,486.61
United States	197	224,049.64

Note: Foregoing returns do not take into account Federal lap-over items growing out of settlements with the U. S. R. R. Administration.

Traffic on the Southern Pacific

In a message addressed to employees and the public, J. H. Dyer, general manager of the Southern Pacific, states that the Southern Pacific Company moved more than 26,000,000 tons of freight during the nine months ending September 30, exceeding the record of any previous similar period by nearly 752,000 tons. Sixty per cent of this tonnage originated on the company's lines. More than 38,000,000 passengers were carried during the nine months noted, an increase of nearly 212,000 passengers over the same period in 1919, the next highest period, and 17,452,000 more than during a similar interval in 1915, the year of the Panama Pacific Exposition at San Francisco. In discussing the use and condition of equipment, Mr. Dyer said that locomotives in freight service during September, 1920, were on the road on an average of 11 hours and made 102 miles, in each 24 hours. This, considering the idle time of the large number of locomotives in exclusive helper service, the time required at terminals and in shops to receive necessary inspection and repairs and awaiting suitable train loading, is an exceptionally good record in time on road and miles run. Passenger locomotives were on the road eight hours and made 182 miles in each 24 hours. The 48,500 freight cars

on the line made an average of 38.6 miles per day, as compared with 30 miles per day which railroads are urged to reach. Only 9.99 per cent of all locomotives and 4.11 per cent of all freight cars on the line were in bad order on September 30, compared with the 15.08 per cent and 4.54 per cent, respectively, for March, 1920. In reviewing the status of carloading, Mr. Dyer says that evidence of good work done by station agents with the help and co-operation of the shippers, is reflected in the carloading report for September, which shows that 79,300 cars were loaded with an average of 26.3 tons per car. This is an increase of 1.5 ton per car over September, 1919, and the best record of this year.

Operating Statistics for September

The Interstate Commerce Commission has issued its monthly table of operating statistics for September and the nine months ended with September. Freight movement for the month on the railroads covered by this report amounted to 40,651,000,000 net ton miles, including non-revenue, an increase of 5.1 per cent as compared with September, 1919. These figures vary slightly from those reported earlier by the Bureau of Railway Economics, whose statistics cover a slightly larger mileage.

For the nine months' period, net ton miles aggregated 330,964,000,000, an increase of 15.4 per cent, as compared with 1919. The average train load for September was 767 tons, as compared with 778 in September, 1919. This was also less than the train load for August, which was 788 tons. The percentage of loaded car miles was 66.8, as compared with 69.6 in September last year, and the percentage of serviceable cars on line daily was 93.2, as compared with 91.4. The car miles per car day averaged 28.4, as compared with 26.7, the net ton miles per loaded car mile 30.1, as compared with 28.4, and the net ton miles per car day averaged 568, as compared with 527 in September last year. This figure establishes a new record for a month. For the nine months' period the net ton miles per car day averaged 486, as compared with 429 in 1919. The average cost per freight train mile for selected accounts was $2.10 in September, 1920, as compared with $1.60 in September, 1918. The cost of locomotive repairs per train mile shows an increase of 7.2 cents; wages of enginemen, 8.2 cents; fuel, 20.1 cents; other locomotive and train supplies, .7 cent; enginehouse expenses, 2.9 cents, and trainmen, 11 cents. The average cost per passenger mile for selected accounts was $1.11, as compared with 90.3 cents. The average cost of coal per net ton was $4.54, as compared with $3.10. For the nine months' period the average cost per freight train mile was $1.97, as compared with $1.62, and the cost per passenger train mile was $1.06, as compared with 88.6 cents.

Jersey Central to Replace Newark Bay Bridge

One of the important railroad structures in the vicinity of New York, the mile and a half trestle of the Jersey Central over Newark Bay, is now being reconstructed under difficult traffic conditions. It is also planned to replace this present low level bridge with a four-track high line of steel and concrete, but the magnitude of the undertaking is such that the present bridge must remain in service for some time. The reconstruction was brought about by the recent acquisition of some heavy Mikado freight locomotives which made it necessary to place a new deck on the present bridge in order to bring the entire line up to the modern specifications of loading and speed.

As deliveries of yellow pine were uncertain, Douglas fir was purchased and transported by boat from the Pacific Coast. It is interesting to note that the timbers were in place in the bridge in less than 60 days from the time they were cut from the trees in the forests of Oregon. The work was divided into eight independent operations, in each one of which a length of track was to be torn up and rebuilt, while trains in both directions ran around the abandoned section on a single track. Freight schedules, as far away as Mauch Chunk, were altered in order to keep slow-moving trains away from the bridge during rush hours, and passenger trains, where possible, were rerouted by way of Newark transfer. To carry the trains of one of the busiest four-track roads in the world on one track only seemed an impossibility, and the success which has been reached and the slight delay occasioned speaks much for the perfection of the plan. An important factor in this has been the modern signal-locking devices for the protection of the single track. Study has been made in great detail as to what trains shall be given superior right, and very costly delays have been deliberately caused to freight trains so that commuters could be transported without delay.

The construction of the new steel bridge will be started as soon as necessary arrangements will permit. This bridge will allow a large proportion of the harbor traffic to pass underneath without the operation of the draw span, and freedom from this delay, together with the additional tracks, will vastly increase the train-carrying capacity of the line.

A. S. C. E. Nominees

A second ticket of officers for the American Society of Civil Engineers has been placed in nomination in opposition to the ticket presented by the nominating committee and published in our issue of October 15, page 667. The second set of nominees is as follows:

President—J. Waldo Smith, Chief Engineer, Board of Water Supply (Catskill Project), New York City.

Eastern Vice-President—Allen Hazen, Consulting Engineer, New York City.

Western Vice-President—Col. Frank G. Jonah, Chief Engineer, St. Louis-San Francisco, St. Louis, Mo.

Treasurer—Arthur S. Tuttle, Deputy Chief Engineer, Board of Estimate and Apportionment, New York City.

Directors—Dist. 1—Col. John P. Hogan, chief of engineering staff, State Water Power Investigations, New York City; Robert S. Parsons, General Manager, Erie Railroad, New York. 4—Harry A. Lane, Chief Engineer, B. & O., Baltimore, Md. 9—Alexander Maitland, Jr., president, Kansas City Bridge Co., Kansas City, Mo. 10—Frank T. Darrow, Assistant Chief Engineer, C., B. & Q., Lincoln, Neb. 11—Richard D. Parker, Engineer, Railroad Commission of Texas, Austin, Tex.

Railroad Section at the Annual Meeting of the A. S. M. E.

In connection with the annual meeting of the American Society of Mechanical Engineers, the railroad section of this society met in the Engineering Societies' building, in New York, Wednesday afternoon, December 8. The meeting was presided over by Mr. E. B. Katte, chief engineer of electric traction, the New York Central lines, and was addressed during the session by Major Fred. J. Miller, retiring president of the American Society of Mechanical Engineers, who has taken a prominent part in the successful inauguration of the technical sections.

The first paper presented at this session related to the static adjustment of trucks on curves. This paper was prepared by R. Eksergin of the Baldwin Locomotive Works and dealt very fully with a mathematical analysis of this phase of locomotive design. Commenting on this paper, Mr. Lawford H. Fry of the Standard Steel Works took exception to a statement appearing in the paper to the effect that adequate consideration of this subject has been wanting in locomotive design. Mr. Fry contended that the uniformity of results arrived at by various locomotive designers indicated a close approximation to a true analysis of the situation. In fact, the very definite requirements placed upon locomotive builders with respect to the design of running gear early necessitated very careful consideration of this subject from a practical standpoint.

Mr. Woodward of the Lima Locomotive Company stated that in the design of locomotive running gear, greater emphasis should be put upon stability to the locomotive operating at high speeds on tangent track than the question of compensating for stresses induced by operation of the locomotive around curves. In the latter case, the wheel flanges on one side of the locomotive lie against the ball of the rail in such a manner as to steady the locomotive, whereas on tangent track the synchronous nosing of modern locomotives operating at high speeds is decidedly the most difficult problem to contend with. Mr. Woodward believes that if this problem could be successfully met in the design of the running gear, no difficulty would be encountered through operation on curves.

The paper was further discussed by L. K. Sillcox, general superintendent of motive power on the Chicago, Milwaukee & St. Paul. Mr. Sillcox's discussion dealt with some of the practical phases involving flange and lateral wear and also outlined at some length the situation as related to electric locomotives in operation on his railroad. In the discussion submitted by Mr. G. R. Hen-

derson of Philadelphia, a very practical method for determining the height of the center of gravity of any locomotive was outlined. This method involved placing the locomotive on a section of track, one side of which rested on scale beams, thus registering the weight imposed by one side of the locomotive. Following this the relative elevation of the rails was altered and the locomotive reweighed, thus admitting determination by means of a very simple mathematical calculation.

"Increasing the Capacity of Old Locomotives," by C. B. Smith, mechanical engineer of the Boston & Maine Railroad, was the second paper presented at this session. The last paper presented at this session dealt with modernizing locomotive terminals and is published in this issue together with an abstract of the discussion. The other papers, together with an abstract of the ensuing discussion, will appear in an early issue of the *Railway Age*.

At the meeting of the Forest Products Section of the A. S. M. E., which was held on Tuesday afternoon, papers were presented on Machining Railroad Crossties, by D. W. Edwards; The Use of Wood in Freight Car Construction, by H. S. Sackett, and Creosoted Wood for Factory Floors, by L. T. Ericson.

The Co-ordination of Railway and Marine Terminals

The Terminals Committee of the Western Society of Engineers, Chicago, has recently submitted a report to that organization on the convention of the American Association of Port Authorities held in Chicago recently, in which certain conclusions relative to the co-ordination of rail and marine terminals were presented which are of interest to railway men. Among the outstanding points in the report of the committee were the following:

That the port problem involves as much the essential element of railroad terminal movement as of marine movement and that the rail problem should receive concurrent study in equal detail. To this end the following resolution was submitted by the committee and adopted in substance unanimously:

"Resolved, that, in view of the evident growing importance of terminal planning and rail-water movements in port, the American Association of Port Authorities appoint a committee to cooperate with such technical bodies as deal with this subject, to the end that such co-operative effort should bring about more rational development of the terminal service feature."

That the functions of warehousing in accelerating port movement and reducing the cost burden on commerce passing through it is very important, especially required in addition to transit sheds for seasonal commodities and tonnage held beyond the normal time limit.

That the long prevailing policy of using steam railroad rolling stock for storage and merchandising should be abated and that this rolling stock should be kept in maximum circulation to lessen the burden of terminal congestion, especially at times of heavy arrivals and departures of vessels.

That the zoning principle in large ports should be developed and applied to both rail and water facilities, i.e., that the design must incorporate special features required to suit special service and commodities, as few harbor works can in fact be successfully designed as a jack-at-all-trades.

That proper handling equipment may be essential to the economic success of competitive ports and when designed for the purpose may distinctly modify the relationship of pier and warehouse construction, floor levels, connecting thoroughfares, etc.

That the Mississippi barge service and the Great Lakes-St. Lawrence water route have a definite basic regulative function to perform in the transportation system of the country, the importance of which should have been long since appreciated before the necessity arose of, in effect, isolating further the great producing interior through the greatly increased rail rates of the present time.

That the distribution of overseas tonnage throughout the Mississippi basin needs careful study and analysis for the purpose of securing more economic and direct movement through port and the minimum cost of haul to destination.

That the two variable elements of (1) differential port charges and (2) competitive water hauls will have an important effect upon the policy of routing tonnage from the interior producing districts for quickest despatch and minimum cost of transportation.

That joint rail-water routes as already effective throughout the major portion of the Mississippi basin have, in effect, established a transportation policy which may likely become of great importance in the future commercial development of the interior.

That the port of Chicago exists largely as a potentiality and calls for immediate consideration in all its various aspects, involving the distinct features of a passenger, commercial and industrial port in which, perhaps, the major aspect is that the rail-water gateway and transshipment point, lake to rail, rail to barge and barge to rail.

That the national policy of conservation should express itself definitely in the most complete possible co-ordination of rail and water operations, rather than the policy of destructive competition, too often advocated as a purely partisan expression of opinion.

Government Ownership Suggested

Hon. Joseph B. Eastman, of Massachusetts, a member of the Interstate Commerce Commission, in a speech at Boston on Tuesday, November 30, advocated government ownership of railroads. He said, in part:

"At every point the railroads are hedged in by the authority of appointees of the President of the United States. The Interstate Commerce Commission may fix rates and divisions; may route freight, control their service, open up their terminals. Their accounts must be kept as it prescribes. No share of stock, no bond may be issued, no new line may be constructed, no old line may be abandoned without its consent. * * * The wages of employees are fixed by the Railroad Labor Board. If the railroads are to meet the needs of the country new capital must flow in at the rate of more than half a billion dollars yearly. For many years private capital sought this field of investment in the hope of speculative rewards, but the growth of public regulation has diminished both the danger and the attraction of railroad investment. The possibility of large speculative rewards has been shrinking until it has all but been eliminated by the legislation of this year.

"The Esch-Cummins Act is a step toward the final goal. I have no faith in the magic of any legislation or of any policy. This is a government of laws and not of men, but the man behind the law is as vital as the man behind the gun. No railroad policy will succeed without the support and earnest effort of the people of the United States.

"Our present railroad policy magnifies private enterprise in word, but minimizes it in deed. It is a partnership of private management and public regulation, but public regulation has at length so outgrown its partner that we are told every day by railroad executives, with a great deal of truth, that the real responsibility for the success or failure of the transportation system rests with the Interstate Commerce Commission. I presume they say the same thing to the Railroad Labor Board. It is my belief that the time will eventually come, if it has not come already, when we must recognize frankly that railroad transportation is a governmental function, and deal with it directly as such.

"Government ownership is by no means the same thing as government management. The crucial test of the present policy will come in the securing of capital. What do we need capital for? Millions are required every year for new cars, new tracks, new stations; and in a future not remote I think I can see also a need for a gradual but complete change in motive power. * * * With electrification, I think I can see in our great cities radical changes, with smoke and noise eliminated, streets laid out over depressed rights of way, and great buildings rising over railroad yards.

"Whether I am right or wrong in this estimate of the possibilities of the future, the continual need for capital no one will deny, or the fact that it is a national need. If the government owns the roads, whatever capital is needed can be secured at relatively low cost. If the roads are left in private hands, the cost of capital will be greater, but more important than this is the doubt whether it can be secured at all when it is needed and where it is needed.

"The question of management is more difficult. The problem has never been faced and dealt with courageously and constructively. It is not a problem which the American nation, with its creative and inventive genius, needs to fear. It is not as difficult as the successful functioning of a dual system of private management and rigorous public regulation. * * * I suggest representation in the management not only of the government but of the two great groups which have most reason to desire the safe and efficient operation of the roads—organized business and organized labor. I feel confident that if thought be given to the question, a way can be found for securing representation of these groups which will be more satisfactory in its operation than the methods by which widely scattered and unorganized stockholders of great railroad companies now select their directors."

Traffic News

Tourist travel to the winter resorts on many lines is breaking records. One or two of the limited trains to California are already running extra sections, two and three times a week and the regular trains on all roads are operating to capacity almost daily.

The Transportation Club of Louisville, Ky., at its regular dinner and meeting, on December 8, discussed the coal question from the angles of production and transportation by rail and by water. Among the speakers were Col. W. W. Harts, division engineer, U. S. Army, Cincinnati; E. L. Douglass, president of the Hazard Coal Operators' Exchange, Cincinnati, and W. L. Mapother, executive vice-president of the Louisville & Nashville, Louisville.

The traffic committee of the American Face Brick Manufacturers and the Dealers Association, in convention at French Lick, Ind., entered a protest against the increase in freight rates. This petition is said to be the largest against increased freight rates on clay products ever presented to the Interstate Commerce Commission. It is jointly signed by the face brick, paving brick, and hollow building tile manufacturers' organizations of the entire country.

The subject for the "Get Together Traffic Discussion" of the Traffic Club of Chicago on December 7, was "Claims with Special Reference to the McCaull-Dinsmore Decision." Leaders of the discussion for the carriers were C. H. Dietrich, freight claim agent on the Chicago, Milwaukee & St. Paul, and J. H. Howard, general claim agent of the Chicago & Alton; for the shippers, G. A. Blair, general traffic manager of Wilson & Co.; J. A. Brough, traffic manager of the Crane Company, and L. F. Berry, traffic manager of Reid, Murdoch & Co.

The injunctions issued by the New York State Supreme Court, prohibiting the railroads from advancing intrastate passenger fares 20 per cent (from 3 cents a mile to 3.6 cents) are still in force, the hearing of arguments at Kingston having been postponed to December 11. Because of a shortage of sheriffs the injunctions were not served promptly on all the roads, and the Erie, having received no order, advanced its rates on December 5. On the New York Central there is a heavy passenger traffic, due in part, it is said, to reports of the increase on the Erie. The railroads' counsel are anxious to press the case to an early hearing, but it is expected that Attorney General Newton will ask for postponement on the ground that the 61 defendants are not co-operating.

Coal Production

The total production of soft coal during Thanksgiving week declined, but the rate per working day increased, according to the weekly bulletin of the Geological Survey. The output is estimated at 11,416,000 tons, which was the largest for any Thanksgiving week of the last four years. Production of bituminous coal during the first 281 working days of the year has been 499,662,000 net tons, less than 5,000,000 tons less than that for 1917 and 36,000,000 tons less than that for 1918. Cumulative lake shipments for the season now stand at 22,958,000 tons.

Passenger Travel on the N. Y. C.

The New York Central Lines, eleven railroads, carried, in the nine months ended October 1, a total of 78,617,456 passengers, an increase of 10,179,378, or 15 per cent over the same period of 1919. The increases on the five principal roads were as follows:

Railroad	1920	1919	Increase	Percentage of increase
New York Central.....	45,903,827	39,682,219	6,221,608	15.65
Boston & Albany	12,615,060	10,628,343	1,986,717	17.16
C. C. C. & St. L.....	6,887,158	6,065,397	821,761	13.54
Pittsburgh & Lake Erie..	5,031,957	4,381,685	650,272	14.84
Michigan Central	5,337,483	4,829,399	508,084	10.52

The Twentieth Century, Limited, for the five months from June 1 to November 1, carried eastbound out of Chicago 33,262 passengers, an average of 218 daily, and westbound out of New York 27,214 passengers, or 177 daily.

Commission and Court News

Interstate Commerce Commission

The commission heard the oral arguments at Washington on December 2 and 3 in the case involving transcontinental freight rates instituted by the Intermediate Rate Association.

The commission has suspended from December 8 until April 7, 1921, the operation of certain tariff changes on iron and steel articles, c. l., from Houston and Galveston to destinations in Louisiana, the result of which would increase the rates from points intermediate to Houston and Galveston.

The commission has suspended until April 3, the operation of certain schedules appearing in Agent F. A. Leland's tariff, indicated to become effective December 4 and 25, which provide for increased rates on glass fruit jars, etc., from Sand Springs, Sapulpa and other points in Oklahoma and Texas, to destinations in Louisiana, Mississippi, Tennessee, Kentucky and Alabama.

The commission has rendered a decision in the case of the Inland Empire Shippers' League vs. the director general, the Oregon-Washington Railroad & Navigation Co., et al., holding that the rates on grain and grain products, c.l., from certain points in Idaho, Eastern Washington and Eastern Oregon to Portland and Astoria, Ore., and intermediate points, and to Vancouver, Wash., and rates on classes and commodities between Portland and Vancouver on the one hand, and points in the Columbia river basin on the other, are not unreasonable. The rates on classes and commodities between Portland and Vancouver on the one hand and points in the Columbia river basin south of the Snake river on the other, are found unduly prejudicial to the extent stated in the report.

Commission Recommends Uniformity in Minimum Weights

The Interstate Commerce Commission on December 4 addressed a notice to all state commissions urging uniform adoption of an order relating to minimum weights on grain and grain products. At the suggestion of several state commissions a conference was held at St. Louis on November 15 to consider minimum weights on grain and grain products. The minima on interstate traffic are now, generally speaking, the marked capacity of car on grain and 48,000 lb. on grain products, which minima also apply on state traffic in a number of states. Tariffs containing these minima expire December 31, 1920, and on January 1, 1921, unless other steps are taken, the minima in effect in 1919 will be restored, which minima were far from uniform.

The commission says:

"Following general conference of shippers and carriers, an executive conference of all the representatives of state commissions present (nine in number) with the representative of this Commission, was held, following the principles of Section 13 of the Interstate Commerce Act. At that time an understanding was reached that all such representatives would recommend to their respective commissions a reduction in the minimum on grain products from 48,000 lb. to 40,000 lb., and upon grain a continuance of the marked capacity minimum, modified by reduction upon oats and ear corn to 80 per cent of marked capacity, by the adoption of a rule requiring protection of the minimum applicable to the size of car ordered, when the carrier furnished a larger car than ordered by the shipper (subject to reasonable restrictions against ordering cars smaller than generally in use) and certain other modifications of the rules designed to meet most of the objections presented by shippers to a continuance of the marked capacity basis.

"This commission has now approved substantially the basis agreed upon at the St. Louis conference and has issued Special Permission No. 51215 authorizing all carriers to establish said basis effective January 1, 1921, upon not less than 10 days' notice in lieu of the varying minima and rules which otherwise would become effective on that date.

"It is hoped that this order is such that its provisions may be made effective upon state and interstate traffic alike.

The commission requests copies of orders issued on this subject.

Equipment and Supplies

Locomotive and Car Orders—11 Months

The locomotives ordered by Class I roads in November, according to the compilation made by this paper, totaled 39. Including orders placed by other roads and industrials, the total for the month was 55. For the 11 months, including November, the total orders for locomotives placed by Class I roads were 1,523, and for all purchasers, 1,656.

The freight car orders for the month of November totaled only 2,250, of which 2,000 were ordered by Class I roads. The total for the year to date is: for Class I roads, 47,142; for other roads, 256; and for private car lines and industrials, 17,672, a total of 65,070.

No passenger car orders were reported in November.

The figures for the month, and the cumulative figures for the 11 months, follow:

TABLE I—LOCOMOTIVES ORDERED IN 1920

	United States						
	Domestic					Canada	
Issue	Class I roads	Other roads	Car-lines or industrials	Total Dom.	U. S. export	Dom.	Export
January	19	9	4	32	206	....	7
February	283	6	4	293	86	85	.....
March	201	14	13	228	89	32	.....
April	414	17	2	433	108	28	.....
May	188	2	7	197	8	3	.....
June	64	1	.....	65	40	4	.....
July	86	.....	9	95	77	2	.....
August	11	.....	3	14	24	.....	.....
September	137	.....	14	151	31	.....	.....
October	81	8	4	93	79	15	.....
November	39	11	5	55	31	4	.....
Total, 11 months	1,523	68	65	1,656	779	173	7

TABLE II—FREIGHT CARS ORDERED IN 1920

	United States						
	Domestic					Canada	
Issue	Class I roads	Other roads	Car-lines or industrials	Total Dom.	U. S. export	Dom.	Export
January	1,300	6	914	2,220	1,000	....	80
February	5,992	....	400	6,392	516	....	....
March	3,069	100	500	3,669	625	6,567	....
April	18,018	....	1,304	19,322	350	4,206	....
May	5,010	100	2,292	7,402	207	....	....
June	1,000	....	2,757	3,757	375	....	....
July	2,850	....	2,618	5,468	66	....	....
August	1,000	50	5,106	6,156	900	....	....
September	2,015	....	771	2,786	408	....	....
October	4,888	....	760	5,648	405	....	....
November	2,000	....	250	2,250	100	....	....
Total, 11 months	47,142	256	17,672	65,070	4,952	10,773	80

TABLE III—PASSENGER CARS ORDERED IN 1920

	United States				
	Domestic			Canada	
Issue	Class I roads	Total Dom.	U. S. export	Dom.	Export
January	107	107	...	...	...
February	35	35	...	...	...
March	148	148	...	102	...
April	328	328	50	...	...
May	57	57	...	72	...
June	...	...	...	...	...
July	60	60	10	...	...
August	...	...	...	...	...
September	79	79	...	...	...
October	9	9	14	...	...
November	...	...	...	...	...
Total, 11 months	823	823	74	174	...

Locomotives

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, Pa., is in the market for a second-hand freight locomotive, to weigh between 75 and 100 tons.

THE WEST PENN POWER COMPANY, Pittsburgh, Pa., has ordered 1 four-wheel switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE OLD BEN COAL COMPANY, Chicago, Ill., has ordered 2 four-wheel switching locomotives from the American Locomotive Company. These locomotives will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE AMERICAN AGRICULTURAL CHEMICAL COMPANY, Boston, Mass., has ordered 1 four-wheel switching locomotive from the American Locomotive Company. This locomotive will have 13 by 20 in. cylinders and a total weight in working order of 65,000 lb.

THE HETCH HETCHY RAILROAD has ordered 1 Prairie type locomotive from the American Locomotive Company. This locomotive will have 18 by 24 in. cylinders, and a total weight in working order of 127,000 lb.; it will be equipped with a superheater.

Freight Cars

THE NEW YORK CENTRAL is asking for prices on from 1,000 to 5,000 steel center constructions, for freight car repairs.

THE NEW YORK QUEBRACHO EXTRACT COMPANY, 80 Maiden Lane, New York, is inquiring for 100 acid tank cars of 8,000 gallons capacity.

THE EGYPTIAN DELTA LIGHT RAILWAYS, LTD., are inquiring, through the car builders, for 260 platform cars; also for spare parts for 48 cars.

THE NORFOLK & WESTERN, reported in the *Railway Age* of October 29, as asking for prices on specialties for 1,000, 120-ton hopper cars, has authorized the construction of these cars in its shops at Roanoke, Va.

THE WESTMORELAND COAL COMPANY, Philadelphia, Pa., has ordered 50 new 55-ton steel hopper cars from the American Railway Equipment Company. These are in addition to the 100 ordered from the same company and reported in the *Railway Age* of October 8.

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street, Philadelphia, Pa., is in the market for 4 second-hand, all-steel, 40-ton capacity, drop-bottom gondola or hopper cars; also for one second-hand, four-wheel caboose car, and for one second-hand steel underframe flat car, 36 to 40 ft. long, of 50 tons capacity.

Passenger Cars

THE PENNSYLVANIA EQUIPMENT COMPANY, 1420 Chestnut street Philadelphia, Pa., is in the market for a second-hand all-steel mail and baggage car, or one of wooden construction, if up-to-date.

Iron and Steel

THE NORTHERN PACIFIC has ordered 35,000 tons of rails from the United States Steel Corporation.

THE NORFOLK & WESTERN has ordered 50,000 tons of rails from the United States Steel Corporation.

THE BUFFALO, ROCHESTER & PITTSBURGH has ordered 5,000 tons of rails from the United States Steel Corporation.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered 5,000 tons of rails from the United States Steel Corporation.

THE BALTIMORE & OHIO'S orders for steel rails aggregate 85,000 tons, for next season's delivery, of which 50,000 tons were previously reported in the *Railway Age*. The orders were distributed between the United States Steel Corporation's plants at Pittsburgh, the Illinois Steel Company at Chicago and the Bethlehem Steel Corporation at Sparrows Point. The total orders involve an expenditure of between $3,500,000 and $4,000,000.

THE SOUTHERN PACIFIC has ordered 2,000 tons of 90-lb. manganese steel rails from the Manganese Steel Rail Company, Hillburn, N. Y., which will be manufactured and rolled at the electric furnaces of the Illinois Steel Company at its south works, Chicago. The rails, which will contain from 0.95 to 1.35 per cent of carbon and from 10.5 to 15 per cent of manganese, are to be used on curves of eight degrees or over in the mountain districts of California.

Supply Trade News

M. J. Rice, formerly general freight agent of the Harvey district on the Baltimore & Ohio, has been appointed traffic manager of the **Buda Company,** Harvey, Ill., effective December 1.

The Air Reduction Sales Company, New York, has just completed building a four-story addition to its apparatus plant, Jersey City, N. J. It is of brick construction with reinforced concrete floors.

J. B. French, formerly connected with T. S. Leake & Co., and more recently with Mellon-Stuart Nelson Company, has been appointed chief engineer of **Joseph E. Nelson & Sons,** railroad building contractors, Chicago.

The **T. J. Moss Tie Company,** St. Louis, Mo., will construct a new tie treating plant at East St. Louis, Ill. The project, which includes the construction of 1⅓ miles of standard gage track and 2 miles of narrow gage track, will cost $200,000 complete.

Alexander S. Greig, formerly vice-president of the St. Louis-San Francisco and recently appointed vice-president of the **H. Channon Company,** Chicago, was born in Aberdeenshire, Scotland, on October 25, 1864, and entered railway service in 1883 in the purchasing department of the Denver & Rio Grande. After successive service in the mechanical and operating departments he became assistant to the general superintendent. In 1895, he was appointed trainmaster on the Atchison, Topeka & Santa Fe, and in 1897 was appointed general superintendent of the El Paso & Northeastern, now a part of the El Paso & Southwestern. For the succeeding five years he was in charge of the construction and placing in operation of 500 miles of line which included the Alamogordo & Sacramento Mountain Railway. He was appointed special assistant to the president of the Chicago, Rock Island & Pacific in 1902 and three years later became assistant to the president of the St. Louis-San Francisco. He was elected assistant to the chairman of the Rock Island-Frisco system in 1907 and at the same time served as chairman of the Committee on Standardization and Economies for these lines. He was promoted to vice-president of the Frisco lines in 1909, in charge of purchases, material and supplies, was assistant to the president and was also at this time president of the New Mexico & Arizona Land Company. When the Frisco went into receivership he became assistant to the receiver. Mr. Greig was a member of the General Conference Committee of railroads to handle the eight-hour day demands of the trainmen and enginemen and also chairman of the Statistics Committee of that body. In November, 1917, he was elected secretary of the General Operating Committee appointed to operate the Eastern railroads and on January 1, 1918, when the government took control, was transferred to the staff of the regional director of the Eastern region and served in that capacity during government control.

A. S. Greig

A. E. Lee has been elected vice-president of the **Reliable Coal & Mining Company,** with offices at 708 Fisher building, Chicago. Mr. Lee was formerly general freight agent of the Chicago & Alton.

Anatole Gollos, electrical engineer of the Chicago Union Station Company, has been granted leave of absence and has sailed for Europe to look after his interests in connection with his automatic train stop. Mr. Gollos has recently made a radical improvement in his design.

J. C. Kopf, formerly manager of the engineering department of the **Duff Manufacturing Company,** Pittsburgh, Pa., has been appointed research engineer, in charge of a newly established research department. **F. W. Schwerin** has been promoted to manager of engineering.

A report has been published in some trade papers that the operation of the foundry of the **Modern Steel Casting Company,** Milwaukee, Wis., had been suspended because of a fire. The company states that this report is not true, as the damage was slight and the foundry is running at normal capacity.

The Falls Rivet Company, Kent, Ohio, has bought from **The Ohio Wire Goods Manufacturing Company,** Akron, Ohio, all its machinery, patents and patterns relating to the manufacturing of cotter pins and flat spring keys. The machinery has been moved from Akron to Kent and is now in operation.

E. R. Gassman, formerly superintendent of telegraph, and later in charge of operation and maintenance of way on the Trinity & Brazos Valley, has been made manager of the order and shipping departments of the **Sinclair Refining Company,** with headquarters at Chicago. Prior to his appointment to this position, he was connected with the transportation division of the Bureau of Markets.

H. H. Cosley, for 15 years in the Chicago sales office of the Cambria Steel Company, has been appointed contracting engineer for the **Decatur Bridge Company,** of Decatur, Ill., with headquarters in the Westminster building, Chicago. Mr. Cosley graduated from the Ohio State University in 1901, and for the succeeding five years was with the Illinois Steel Company, which concern he left to enter the service of the Cambria Steel Company.

P. C. Cady, who was for several years with the mechanical engineering department of the New York Central, has opened an office at 133 Greenwich street, New York, and will represent the following concerns: Guilford S. Wood Company, Chicago; J. Faessler Manufacturing Company, Moberly, Mo.; Coale Muffler & Safety Valve Co., Baltimore, Md.; W. C. Dunn Company, Cincinnati, Ohio, and the Virginia Equipment Company, Oak Harbor, Ohio.

Western Electric Company Gives Employees Opportunity to Buy Bonds on Installment Plan

Twenty-two thousand employees of the Western Electric Company are being offered an opportunity to be among the holders of bonds of their corporation. The board of directors has approved an extension of the plan to enable its personnel to purchase Western Electric 5 year 7 per cent convertible gold bonds. Instead of limiting its investment arrangements to its older employees as has been the custom in the past, the company is encouraging those who have six months or more continuous service by December 1 to acquire their quota of the securities.

The older employees will also benefit under the new offer. Those who did not subscribe when the bonds were issued originally can apply for their share now. In no case, however, can the total face value of any employee's holdings in the issue exceed $100 for each $300 of his annual rate of pay.

The sale to the employees is on an installment basis, payment being made in a manner similar to that used during the Liberty Loan drives. The subscribers receive interest on the money they pay in and also on the bonds themselves so that instead of paying the full subscription price of $98.50 the employee's cost is only $89.84 on each $100 bond or about 8.9 per cent a year return on the investment. These bonds are now quoted at about 99.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has applied to the Interstate Commerce Commission for authority to abandon a part of its Barnwell branch in San Bernardino County, Cal., a distance of 15 miles.

ATCHISON, TOPEKA & SANTA FE.—This company is constructing 10 additional stalls at its engine house at Amarillo, Tex., each stall to be 120 ft. long. The company is also lengthening 12 of the present engine stalls from 92 to 120 ft. The construction is of concrete and will cost approximately $125,000.

BOSTON ELEVATED.—This company is constructing a storage yard at Forest Hills, Mass., which will cost approximately $630,000. A car house and inspection shop at Forest Hills, to cost approximately $500,000, and a general repair shop at Everett, complete with equipment for machine, wood and blacksmith work, a foundry and a paint shop, to cost altogether approximately $3,500,000, are contemplated.

CANADIAN PACIFIC.—This company has awarded a contract to Stewart & Welch, Calgary, Alta., for grading in connection with the construction of a line from Acme, Alta., east to Drumheller, a distance of 37 miles. The project, which is already under way, will involve the construction of four bridges with steel and concrete abutments of 100 ft., 110 ft., 130 ft. and 150 ft. lengths, respectively.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—This company, which was noted in the *Railway Age* of October 29 (page 773), as contemplating the construction of car repair shops to cost approximately $140,000, at Lafayette, Ind., has awarded the contract for this work to A. E. Kemmer, Lafayette. The structure, which will have dimensions of 85 ft. by 440 ft., will be of brick and steel construction.

DENVER & SALT LAKE.—This company is rebuilding its shops at Utah Junction, Colo., which were destroyed by fire, at a loss of $250,000.

EASTERN TEXAS.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its line between Lufkin, Tex., and Kennard, Tex., a distance of 30.3 miles. The people of the community served by the line objected to the granting of the certificate, offering testimony as to the prospects for further increases in tonnage, but made no definite showing, the Commission says, that within any reasonable time there would be sufficient tonnage to pay the operating expenses of the road. To meet their objections the company has offered to sell its line to any local interests for $50,000 and the Commission's order is made subject to the right of persons interested in the community served to purchase the property at a figure not in excess of $50,000.

GREAT NORTHERN.—This company has awarded a contract to the N. W. & W. A. Nelson Co., Minneapolis, Minn., for grade elimination work at East Hennepin avenue, Minneapolis, where the roadway and street-car tracks will run under the railway. The project, which is to cost about $400,000, involves raising the grade of the railway, the construction of concrete abutments and the placing of a steel bridge.

GULF COAST LINES.—This company is constructing eight miles of line southwest of New Iberia, La., to serve the salt mines being developed on Jefferson Island.

GULF, MOBILE & NORTHERN.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its Ellisville branch in Jones County, Miss.

ILLINOIS CENTRAL.—This company is accepting bids for the strengthening and raising of its levee at Helena, Ark., at a cost of approximately $30,000.

LEHIGH VALLEY.—This company has purchased at public auction, for $142,000, a 40-acre tract of land at East Penn Junction, Pa., with the purpose in view of constructing on it a large freight yard. Definite plans for undertaking this work have not been announced as yet.

NORTHERN PACIFIC.—A contract has been let by this company to the Bay City Foundry & Machine Company, Bay City, Mich., for the machinery for a coaling station at Hinckley, Minn.

OAHU RAILWAY & LAND COMPANY.—This Hawaiian line will build a modern passenger station at Honolulu, including a restaurant and providing space for the general offices of the company.

PERE MARQUETTE.—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of a branch line of this company from Rapid City, Mich., to Kalkaska, 11.47 miles. An answer to the petition of the railroad was filed by the Michigan Public Utilities Commission stating that the Michigan laws provide that no common carrier shall abandon any portion of its line except by permission of the Michigan commission. The state commission took the position that inasmuch as the line proposed to be abandoned lies wholly within the state of Michigan, its permission is a condition precedent to the granting of any certificate by the Interstate Commerce Commission. The position of the state was that there is a concurrent control which should be exercised in the matter; that the railroad is engaged in intrastate, as well as interstate, commerce, and that before the line in question can be abandoned an application for permission to abandon must also be made to the state commission. Beyond stating these facts, the Interstate Commerce Commission does not discuss the position taken by the state authorities, but finds that the present and future public convenience and necessity permit the abandonment of the line and says that a certificate will accordingly be issued.

PENNSYLVANIA.—This company has let a contract to the Roberts & Schaefer Company, Chicago, for the construction of a 1,200-ton reinforced concrete coaling station and two concrete sanding plants at Wilmington, Del.

PHILADELPHIA, NEWTON & NEW YORK.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of a short line in Philadelphia for which it is proposed to substitute a new connection.

SPOKANE, PORTLAND & SEATTLE.—This company has let a contract for a 300-ton automatic coaling station to be erected at Fallbridge, Wash., to the Bay City Foundry & Machine Company, Bay City, Mich.

SPOKANE & BRITISH COLUMBIA.—This company has applied to the Interstate Commerce Commission for a certificate authorizing it to abandon a line in Ferry County, Wash., 36.3 miles, which has been paralleled by a line of the Great Northern and which for some time has failed to pay operating expenses.

UINTAH.—This company contemplates the construction of a line from Walton, Utah, to Bonanza, a distance of 20 miles.

UVALDE & NORTHERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from Uvalde to Camp Wood, Tex., a distance of 37 miles.

WICHITA FALLS & SOUTHERN.—This company, which was noted in the *Railway Age* of November 26 (page 951) as applying to the Interstate Commerce Commission for certificates authorizing the construction and operation of a new line from Newcastle to Breckinridge, Tex., a distance of 44 miles, has begun the construction of this line. The road will be built to Breckinridge, by way of Graham, South Bend and Eliasville.

THE NATIONAL PARK SERVICE, according to the annual report of the Secretary of the Interior, in 1920 handled the largest volume of tourist travel in the history of the parks; 1920 season, 919,504; 1919 season, 755,325; 1918 season, 451,661; 1917 season, 488,268; 1916 season, 356,097; 1915 season, 334,799; 1914 season, 235,193. Automobile travel to the parks during the 1920 season was 128,074; 1919, 97,721; 1918, 53,966; 1917, 54,692; 1916, 29,358. There was also handled the largest volume of tourist travel in the history of the national monuments; 1920 season, 138,951; 1919 season, 56,191.

Railway Financial News

BUFFALO & SUSQUEHANNA.—An extra dividend of 3 per cent has been declared on the outstanding $3,000,000 common stock, in addition to the regular quarterly dividend of 1¾ per cent, both payable December 30 to holders of record December 15. Extra dividends aggregating 2 per cent yearly were paid in 1919, 1918 and 1917.

CENTRAL OF GEORGIA.—This company has applied to the Interstate Commerce Commission for authority, if the commission considers it necessary, to execute and authenticate $998,000 of its 6 per cent refunding and general mortgage bonds under its mortgage of April 1, 1919, to be placed in the treasury to be used as collateral when needed for a loan from the United States government or as security in connection with its guaranty.

CENTRAL WISCONSIN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the acquisition and operation of the railroad now known as the Fairchild & Northwestern, operating from Owen to Cleghorn, Wis.

CHICAGO & NORTH WESTERN.—This company has applied to the Interstate Commerce Commission for authority to create an equipment trust for $10,000,000 and to sell $9,630,000 of 7 per cent equipment trust certificates, dated February 1, April 1 and May 1, 1921, and payable in 15 annual installments, for the purchase of equipment amounting to $9,684,093. The company proposes to invite bids for the sale of these securities at not less than 97 per cent of par.

CHICAGO GREAT WESTERN.—The Interstate Commerce Commission has approved a loan of $240,000 to this company to enable it to meet the interest on bonds of the Mason City & Ft. Dodge, a subsidiary line.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company has filed an application with the Interstate Commerce Commission for authority to guarantee a 10-year, 6 per cent promissory note of the Louisville & Jeffersonville Bridge & Railroad Company for $108,000, payable to the Secretary of the Treasury.

DELAWARE & HUDSON.—This company has applied to the Interstate Commerce Commission for authority to issue $9,634,000 of capital stock from time to time for conversion purposes.

DETROIT & TOLEDO SHORE LINE.—This company has applied to the Interstate Commerce Commission for authority to increase its capital stock from $1,500,000 to $2,500,000 to reimburse the treasury for expenditures for additions and betterments out of income and to provide additional stock to be issued upon the payment of $501,000 of promissory notes for the purchase of 200 steel hopper cars allocated by the Railroad Administration.

FERNWOOD, COLUMBIA & GULF.—This company has applied to the Interstate Commerce Commission for authority to issue $300,000 of refunding mortgage bonds dated January 1, 1921, to capitalize improvements heretofore made out of income and to be available as security for an equipment loan and a loan from the United States.

FORT SMITH & WESTERN.—The receiver has been given authority by the Interstate Commerce Commission to issue and pledge as collateral security for a loan of $156,000 from the revolving fund, a receiver's certificate for that amount at 6 per cent maturing November 1, 1925.

FT. SMITH & WESTERN.—The Interstate Commerce Commission has approved a loan of $156,000 to the receiver to aid the company in the purchase of equipment and in making additions and betterments to existing equipment and ways and structures at a total estimated cost of $425,356. The company itself is required to finance about $270,000 to meet the loan of the government.

GULF PORTS TERMINAL RAILWAY.—The Interstate Commerce Commission has denied the application of this company for a loan from the revolving fund of $300,000 on the ground that it is not a common carrier, subject to the interstate commerce act, and that it has failed to show that the loan is necessary to enable the applicant properly to meet the transportation needs of the public or that the prospective earning power and character and value of the security offered are such as to furnish reasonable assurance of ability to repay the loan.

LEHIGH VALLEY.—See editorial and article elsewhere in this issue.

LOUISVILLE & JEFFERSONVILLE BRIDGE & RAILROAD COMPANY.—This company has applied to the Interstate Commerce Commission for authority to issue $162,000 of its 4 per cent first mortgage gold bonds, to be pledged with the Secretary of the Treasury as security for its note for a loan.

MILLEDGEVILLE RAILWAY.—This company has filed an application with the Interstate Commerce Commission for authority to increase its capital stock from $30,000 to $60,000 for the purpose of retiring its outstanding first mortgage bonds.

PITTSBURGH & WEST VIRGINIA.—This company has filed an application with the Interstate Commerce Commission for a certificate authorizing the acquisition of the property and franchises of the West Side Belt, of which it had previously acquired a majority of the capital stock. The company also filed an application for authority to increase its capital stock from $39,600,000 to $47,000,000 for the acquisition of the West Side Belt.

ST. JOSEPH BELT.—The Interstate Commerce Commission, Division 4, has rendered a decision denying the application of this company for a certificate representing the amount of its losses during the federal control period as provided in Section 204 of the transportation act, holding that the road was not under private operation during any portion of the federal control period and that its operation was in legal effect operation by the government. No compensation has been paid the owners of the road by the director general under the provisions of the federal control act on the ground that the road was under private operation during the entire period. The road was advised in a letter from the regional director of the Central Western Region on March 25, 1919, that the road was not under federal control and that the Railroad Administration exercised no jurisdiction over the line, but the company declined to recognize this as a relinquishment. The company filed a statement indicating a net deficit in railway operating income for the federal control period amounting to $165,901, of which about $115,000 accrued in the period from April, 1919, to February, 1920. The American Short Line Railroad Association contended that the road was not at that time under federal operation, although under federal control, and is, therefore, entitled to the benefit of Section 204 for the entire period of federal control. The report says it is a well-known fact that the extent to which the director general found it necessary to change existing organizations and practices varied greatly with the different railroads. Under these circumstances, an attempt to draw a line of distinction between roads taken over by the government, classifying some as federally operated and others as privately operated, would meet great difficulties. A more practical view is to regard the taking over of the roads by the President, the appointment of the director general and the assumption of authority by him and his representatives as supplying the necessary elements to constitute federal operation as well as federal control. In the case of the St. Joseph Belt, the report says, the director general exercised control in the most important matters affecting the income of the carrier.

TRANS-MISSISSIPPI TERMINAL RAILROAD.—The Interstate Commerce Commission has authorized this company, the Texas & Pacific, and the Missouri Pacific to enter into a contract extending the maturity date of 6 per cent, three-year gold notes heretofore extended to November 1, 1920, with interest at 7 per cent, issued by the Trans-Mississippi Terminal Company, a predecessor of the Trans-Mississippi Terminal Railroad Company, from November 1, 1920, to November 1, 1923, with interest increased from 7 to 7½ per cent. The Texas & Pacific and the Missouri Pacific were also authorized to assume obligation in respect to the notes as guarantors.

VIRGINIA SOUTHERN.—This company has applied to the Interstate Commerce Commission for authority to issue $150,000 of 6 per cent mortgage bonds, of which $76,000 is to be deposited with the government as security for a loan of $38,000, and $34,000 is to be used as collateral for a loan from the First National Bank of Richmond, Va.

Railway Officers

Executive

A. C. Mann has been elected vice-president of the Illinois Central, in charge of purchases and supplies, with headquarters at Chicago, effective December 10.

F. P. Brady, general manager of the Canadian National, headquarters at Montreal, has been appointed assistant to the executive, with headquarters at Toronto, effective December 1.

D. J. Kerr, assistant to the vice-president, executive department, of the Great Northern, has been appointed assistant to the vice-president in charge of operation, effective December 1.

A. Miller, general counsel of the Kansas, Oklahoma & Gulf with headquarters at Kansas City, Mo., has been appointed receiver of the Missouri, Oklahoma & Gulf, with the same headquarters, succeeding Alexander New, who has resigned.

Financial, Legal and Accounting

J. W. Connell has been appointed assistant freight claim agent on the Western lines of the Canadian National, with headquarters at Winnipeg, Man.

Operating

J. D. MacNutt has been appointed assistant superintendent of the Canadian National, with headquarters at Truro, N. S.

W. L. Whiter has been appointed acting assistant trainmaster on the Fort Wayne division of the Pennsylvania, with headquarters at Fort Wayne, Ind., effective December 1.

W. I. Munro, superintendent of the Canadian National at Saskatoon, Sask., has been transferred to Winnipeg, Manitoba, succeeding J. C. O'Donnell, promoted, effective December 4.

M. L. Jennings has been appointed trainmaster of the Sacramento division of the Southern Pacific, with headquarters at Sacramento, Cal., succeeding F. J. Berry, resigned, effective December 1.

L. F. Cabell has been appointed terminal trainmaster of the Chesapeake & Ohio with headquarters at Ashland, Ky. **G. P. Gibbs** has been appointed trainmaster of the Big Sandy division with headquarters at Paintsville, Ky.

W. W. McCauley, chief clerk to the assistant general superintendent of transportation of the Northern Pacific, with headquarters at St. Paul, Minn., has been promoted to assistant general superintendent of transportation, with the same headquarters, effective November 16.

H. L. Hungerford, general superintendent of the Eastern district of the Southern with headquarters at Charlotte, N. C., has, at his own request, been relieved of his duties as general superintendent and has been appointed superintendent of the Charlotte division with headquarters at Greenville, S. C., effective December 1.

P. L. Gaddis, trainmaster of the Northern division of the Florida East Coast with headquarters at New Smyrna, Fla., has been promoted to assistant superintendent of transportation, with the same headquarters. **C. C. Thorpe,** assistant trainmaster of the Northern division, succeeds Mr. Gaddis as trainmaster and **J. S. Douglas** succeeds Mr. Thorpe. These appointments are effective December 1.

P. H. McCauley, whose appointment as general superintendent of transportation of the Northern Pacific was noted in the *Railway Age* of November 5 (page 819), entered the service of the Northern Pacific in 1889 as a junior clerk in the car accountant's office. Later he was promoted to chief clerk of the statistical division of that office and afterwards to chief clerk to the car accountant. In 1910 he was appointed superintendent of transportation and held this position until his recent promotion.

J. H. Redding, assistant superintendent of the Pittsburgh division of the Pennsylvania with headquarters at Cresson, Pa., has been appointed superintendent of the Wheeling division with headquarters at Wheeling, W. Va. **W. C. Higginbottom** succeeds Mr. Redding as assistant superintendent of the Pittsburgh division. **G. W. Curtis** has been appointed freight trainmaster of the Pittsburgh division with headquarters at Pittsburgh and **J. C. Armstrong** has been appointed trainmaster of the Monongahela division with headquarters at Uniontown, Pa.

Edwin I. Ford, whose resignation as general superintendent of the Chesapeake & Ohio terminals at Newport News, Va., and election as vice-president and traffic manager of the Consolidated Pocahontas Coal Co. was announced in the *Railway Age* of November 19 (page 953), was born April 18, 1871, in Goochland County, Va. He received a public school education and began his railway service in 1886 as a water boy for the Chesapeake & Ohio at Newport News, Va. Shortly thereafter he became a messenger boy in the general agent's office, and subsequently served as a clerk in the yard office, as chief yard clerk and as a switchman. In 1892 he became night yardmaster, in 1897 general yardmaster, in 1907 trainmaster, and in 1909, superintendent at Newport News. From 1913 to 1915 he was superintendent of the Richmond division, but was called back to Newport News in the latter year to take charge of the terminal. The operations of the Newport News terminal under Mr. Ford's direction were greatly increased during the war by the heavy increase in the volume of traffic entering and leaving that port. Early in 1920 he was appointed general superintendent at the Newport News terminal, the position he held at the time of his resignation.

E. I. Ford

W. C. Hudson, superintendent of the Charlotte division of the Southern, has been appointed general superintendent, eastern district, with headquarters at Charlotte, N. C., effective December 1. Mr. Hudson was born at Scottsburg, Va., November 9, 1873. He received a common school education and entered railway service in 1889 as an extra telegraph operator and relief agent with the Richmond & Danville, now a part of the Southern. He remained in this service until 1894, when he went to the Asheville division of the Southern as an agent and operator. In 1897 he was promoted to despatcher at Asheville, N. C., and, in 1905, to chief despatcher with the same headquarters. Another promotion, in 1907, took him to Charleston, S. C., as trainmaster, and, the following year, he returned to Asheville as chief despatcher. In 1909 he was again appointed trainmaster, this time at Knoxville, Tenn. In 1912 he was appointed superintendent of the Charleston division. Subsequently he served in the same capacity on the Columbia, Washington, Asheville, and Charlotte divisions. Mr. Hudson was superintendent of the Charlotte division when he was promoted to general superintendent.

W. A. Kingsland, assistant general manager of the Canadian National with headquarters at Montreal, has been appointed general manager, with the same headquarters, succeeding F. P. Brady promoted. **L. S. Brown,** general superintendent with headquarters at Moncton, N. B., has been

appointed assistant general manager, Eastern Lines, with headquarters at Montreal, succeeding Mr. Kingsland. **W. R. Devenish,** superintendent with headquarters at Moncton, N. B., has been appointed general superintendent of the Ontario district, with headquarters at Toronto. **J. C. O'Donnell** has been appointed general superintendent of the Maritime district with headquarters at Moncton, N. B., succeeding Mr. Brown. **A. P. Gorbell,** car accountant with headquarters at Moncton, N. B., has been appointed superintendent of car service, lines east and south of the St. Lawrence River, with the same headquarters, succeeding **W. N. Rippey,** who has been appointed superintendent of transportation of the Maritime district, with headquarters at Moncton. **A. C. Barker,** superintendent of telegraph with headquarters at Moncton, succeeds Mr. Devenish as superintendent of the Moncton division. These appointments are effective December 1.

F. G. Gurley, whose appointment as superintendent of the Wymore division on the Chicago, Burlington & Quincy, with headquarters at Wymore, Neb., was announced in the *Railway Age* of November 19 (page 905), was born at Sedalia, Mo., in February, 1889. He entered railway service in July, 1904, as a clerk and stenographer on the Burlington, being stationed in the trainmaster's office at Milan, Mo. In 1906 he was transferred to the office of the superintendent at Sheridan, Wyo., and served there and in the office of the general superintendent at Alliance, Neb., until 1911. In that year he was promoted to train and station inspector of the Wyoming district, with headquarters at Alliance, Neb. In 1913 he was again promoted and transferred to Sterling, Colo., as yardmaster. After serving for two years in this position, Mr. Gurley was promoted to trainmaster, and during the next 3½ years he served in that capacity on the Casper, Alliance, Lincoln and Omaha divisions, successively. In 1918 he was assigned to special staff work, being associated with the general manager of the lines west of the Missouri river, with headquarters at Omaha, Neb. At the time of his recent appointment Mr. Gurley was serving on the staff of the vice-president in charge of operation, with headquarters at Chicago, a position to which he had been appointed in 1919.

Traffic

H. E. Larsen has been appointed commercial agent on the Southern, with headquarters at Oklahoma City, Okla., effective December 1. **M. Martin** has been appointed commercial agent, with headquarters at Houston, Tex., effective November 15.

H. A. Benjamin, assistant general freight and passenger agent of the Waterloo, Cedar Falls & Northern with headquarters at Waterloo, Iowa, has been promoted to general freight and passenger agent, with the same headquarters, effective December 1, succeeding C. M. Cheney.

J. Waugh, commercial agent on the Grand Trunk, with headquarters at San Francisco, Cal., has been appointed commercial agent of the Canadian National and Grand Trunk Pacific Coast Steamship Company, in addition to his former duties, succeeding **W. F. Barry,** who has been transferred to the passenger department.

The New York Central has appointed general agents in its freight department as follows: **J. H. Love,** Kansas City, Mo.; **A. W. Cassels,** Seattle, Wash.; **H. R. Ballard,** St. Paul, Minn.; **A. C. Huggins,** New Orleans, La.; **M. A. Greding,** Dallas, Tex.; **A. L. Evans,** Minneapolis, Minn.; **T. C. Porteous,** Los Angeles, Cal.; **W. F. Greaves,** Birmingham, Ala.; **J. L. Carleton,** Oklahoma City, Okla.; **R. J. Nicoud,** Milwaukee, Wis.; **W. W. Dickinson,** San Francisco, Cal.; **M. J. Sweet,** Omaha, Neb.; **G. H. Johnston,** Memphis, Tenn.; **J. J. Ford,** Denver, Colo.

J. F. Vosburg, general freight agent of the Chicago & Alton, with headquarters at Chicago, has been promoted to freight traffic manager, effective December 1, succeeding **C. W. Galligan,** resigned to become chairman of the Illinois Freight Association. **E. L. Carr,** chief clerk to the vice-president, has been promoted to general freight agent, succeeding A. E. Lee, resigned. **J. L. Behrle,** chief of the tariff bureau, has been promoted to assistant general freight agent, with headquarters at Chicago. **C. R. Davidson,** chief clerk, passenger department, has been appointed assistant general passenger agent.

Edward L. Carr, who has been promoted to general freight agent of the Chicago & Alton, with headquarters at Chicago, effective December 1, was born at Peosta, Iowa, in September, 1884. He was educated at Epworth Seminary, Epworth, Iowa, and entered railroad service in September, 1902, in the claim department of the Chicago, Milwaukee & St. Paul, where he was employed in various clerical positions until October, 1906. At that time he left the service of the St. Paul to accept a position with the Chicago & Alton as a stenographer in the freight department at Chicago. After serving as stenographer and clerk until September, 1912, Mr. Carr was transferred and promoted to chief clerk in the tariff department. In May, 1916, another promotion made him chief clerk to the vice-president in charge of traffic. He was serving in this position at the time of his recent promotion.

E. L. Carr

Augustus Brostedt, who has been promoted to general freight agent on the Canadian National, with headquarters at Vancouver, B. C., was born in Sweden, In 1877, and was educated at Carleton College, Northfield, Minn. He entered railway service in 1898 as an operator, cashier and agent on the Great Northern at Moorehead, Minn., where he served until 1901, when he was made traveling passenger agent, with headquarters at Philadelphia, Pa. In 1903, he was promoted to district passenger agent, with headquarters at Pittsburgh, Pa., and in 1905 he was made northern passenger agent and transferred to Duluth, Minn. After serving for two years in this capacity, Mr. Brostedt was promoted to district freight and passenger agent, with headquarters at Winnipeg, Man. He left the service of the Great Northern in 1913 to become district freight agent on the Canadian Northern, with headquarters at Calgary, Alta. He was transferred to Vancouver, B. C., in 1915, and promoted to district freight and passenger agent. At the time of his recent promotion, he was serving as assistant general freight and passenger agent of the Canadian National, with headquarters at Vancouver, a position to which he had been appointed in 1919.

Augustus Brostedt

Joseph G. Kerr has been appointed assistant general freight agent of the Louisville & Nashville, with headquarters in Louisville, effective December 1. Mr. Kerr began service with the Louisville & Nashville in 1903 as stenographer in the freight claim department and since then has advanced through various positions in the traffic department. In October, 1918, he was transferred to Washington as traffic assistant to the

director of traffic, United States Railroad Administration, and upon return of the railroads to their owners in March of this year, he returned to Louisville as assistant to the vice-president, representing the Louisville & Nashville in rate litigation before the state and Interstate Commerce Commissions.

C. R. Davidson, who has been promoted to assistant general passenger agent of the Chicago & Alton, with headquarters at Chicago, effective December 1, was born at Madison, Wis., and was educated at the University of Wisconsin. He entered railroad service in December, 1881, with the Chicago & North Western, but left that road in 1882 to accept employment with the Chicago, Burlington & Quincy, and served as rate clerk and chief clerk to the general passenger agent of the Burlington until 1897. In that year, he was appointed secretary of the Western Passenger Association, with headquarters at Minneapolis, Minn., a position which he held until February, 1898, when he was transferred to Kansas City, Mo., where he served until January 1, 1900. On that date he entered the service of the Chicago & Alton as chief rate clerk. At the time of his recent promotion, Mr. Davidson was serving as chief clerk in the general passenger office.

John F. Vosburgh, who has been promoted to freight traffic manager of the Chicago & Alton, with headquarters at Chicago, effective December 1, was born in Wisconsin, and after receiving a normal school education, entered railway service in 1899 in the operating department of the Chicago, Milwaukee & St. Paul, at Minneapolis, Minn. During the next four years, Mr. Vosburgh was successively employed in the passenger departments of the St. Paul, and the Minneapolis, St. Paul & Sault Ste. Marie, and in the operating department of the Chicago, Rock Island & Pacific. In 1903, he entered the service of the Minneapolis & St. Louis, being employed in the traffic department. After serving in various clerical positions in the traffic department, he was promoted to chief clerk to the traffic manager, with headquarters at Minneapolis, but left the Minneapolis & St. Louis in 1914, to accept a position as chief clerk to the general traffic manager of the Chicago & Alton, with headquarters at Chicago. In May, 1916, Mr. Vosburgh was promoted to assistant general freight and passenger agent of the Alton, and was serving in this position at the time of his recent promotion.

J. F. Vosburgh

Mechanical

J. W. Johnston, chief inspector of car lighting of the Canadian National, with headquarters at Toronto, has had his jurisdiction extended to include the Grand Trunk Pacific.

L. C. Tyler has been appointed road foreman of engines of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Urbana, Ill., succeeding Charles McCarty, transferred, effective November 4.

W. M. Green has been appointed road foreman of engines of the Big Sandy division of the Chesapeake & Ohio with headquarters at Paintsville, Ky., succeeding **D. S. Baals,** resigned. **W. A. Mordica** has been appointed road foreman of engines and assistant trainmaster, Shelby coal district, with headquarters at Shelby, Ky. These changes are effective November 22.

Engineering, Maintenance of Way and Signaling

H. F. McFarland, Jr., chief engineer of the Wichita Falls, Ranger & Fort Worth, has been appointed chief engineer of the Wichita Falls & Southern, with headquarters at Graham, Tex.

D. W. Dower has been appointed signal supervisor of the Los Angeles division of the Southern Pacific, with headquarters at Los Angeles, Cal., effective November 1, succeeding **C. A. Veale,** who has been assigned to other duties.

G. N. Toops, assistant engineer on the Kansas, Oklahoma & Gulf, with headquarters at Muskogee, Okla., has been promoted to chief engineer, with the same headquarters, effective December 1, succeeding **W. O. Galbreath,** who has resigned.

W. H. Penfield, engineer of track maintenance on the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been appointed engineer maintenance of way, with the same headquarters, effective December 1. The position of engineer of track maintenance has been abolished.

J. N. Thompson, whose appointment as superintendent maintenance of way of the Pittsburgh, Shawmut & Northern was announced in the *Railway Age* of December 3, 1920 (page 1002), was born in 1877 at Scio, Ohio. He was graduated from the Scio High School and College in 1900, having entered railway service in 1896 as a trackman with the Pittsburgh, Cincinnati, Chicago & St. Louis. From 1901 to 1903 he served as a rodman and chief clerk to the engineer maintenance of way of the Cleveland, Cincinnati, Chicago & St. Louis at Galion, Ohio, and Springfield, Ohio. In 1905 and 1906 he served as an accountant in the chief engineer's office of the Brooklyn Rapid Transit, Brooklyn, N. Y. In 1907 he became chief clerk to the engineer maintenance of way of the Pittsburgh, Shawmut & Northern. In 1911 he was appointed general foreman and roadmaster and in 1914 chief clerk to the chief engineer. From 1917 until the time of his recent promotion Mr. Thompson has served as secretary to the receiver in the engineering department.

Purchasing and Stores

F. Osterman, chief clerk of the purchasing department of the Chicago Great Western, has been appointed assistant purchasing agent of the Pere Marquette, with headquarters at Detroit, Michigan.

H. W. Concannon has been appointed division storekeeper of the Salt Lake division of the Southern Pacific, with headquarters at Ogden, Utah, succeeding S. J. DeGraff, assigned to other duties, effective December 1.

H. P. Buchenery, assistant division storekeeper of the Southern Pacific, with headquarters at Sparks, Nev., has been promoted to division storekeeper, with headquarters at Tracy, Cal., succeeding **V. R. Taylor,** transferred to Tucson, Ariz. **J. F. McAuley** succeeds Mr. Buchenery. These appointments are effective December 1.

Obituary

V. S. Crosby, treasurer of the Union Pacific, died at his home in New York December 2. Mr. Crosby was born March 15, 1860, at Troy, N. Y. He was educated at the Columbia College School of Mines and served six years as a secretary in the American legation at Berlin. Returning to this country, he went into the mining and brokerage business in Colorado. In 1898 he was appointed treasurer of the Union Pacific and served until the time of his death.

Robert Speer Miller, master car builder of the New York, Chicago & St. Louis, died suddenly of heart failure at his home at Cleveland, Ohio, December 1. Mr. Miller was born in Washington county, Pennsylvania, September 13, 1856. He entered railway service in 1879 with the Pittsburg, Cincinnati, Chicago & St. Louis as a rodman in the engineering department. In 1882 he entered the service of the New York, Chicago & St. Louis and subsequently he served as foreman, general car inspector and master car builder of the same road, which latter position he held at the time of his death.